SERVICE MANUAL

TotalCare® Bed System

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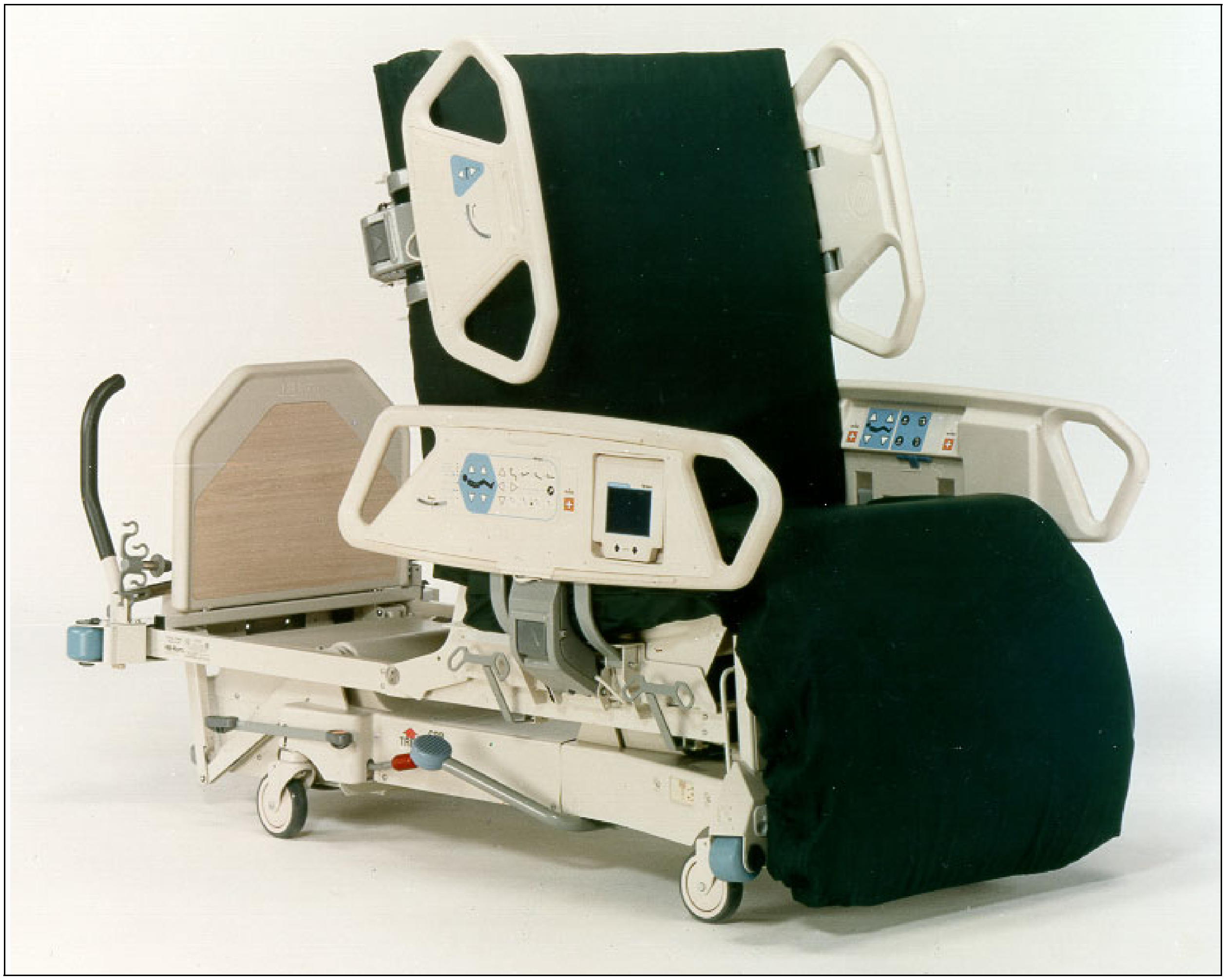

Product No. P1900-00

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TotalCare® Bed System
Service Manual

Revisions

Revision Letter	Pages Affected	Date
Original Issue		November, 1997
A	All	April, 1999
B	All	June, 2000
C	All	January, 2001
D	All	January, 2002
E	All	July, 2003

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Sixth Edition

First Printing 1997

Printed in the USA

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Introduction

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Purpose

This manual provides requirements for the TotalCare® Bed System normal operation and maintenance. It also includes a parts list (in chapter 5) for ordering replacement components.

Audience

This manual is intended for use by only facility-authorized personnel. Failure to observe this restriction can result in severe injury to people and serious damage to equipment.

Organization

This manual contains seven chapters.

Chapter 1: Introduction

In addition to a brief description of this service manual, chapter 1 also provides a product overview.

Chapter 2: Troubleshooting Procedures

Repair analysis procedures are contained in this chapter. Use these procedures to gather information, identify the maintenance need, and verify the effectiveness of the repair.

Chapter 3: Theory of Operation

This chapter describes the application of the mechanical, electrical, and hydraulic systems employed in this product.

Chapter 4: Removal, Replacement, and Adjustment Procedures

Chapter 4 contains the detailed maintenance procedures determined necessary in chapter 2.

Chapter 5: Parts List

This chapter contains the warranty, part-ordering procedure, and illustrated parts lists.

Chapter 6: General Procedures

Cleaning, preventive maintenance, and other general procedures are described in this chapter.

Chapter 7: Accessories

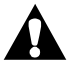
A list of additional products, that can be used in conjunction with the TotalCare® Bed System, is available in chapter 7. Installation procedures for these accessories are also included.

Typographical Conventions

This manual contains different typefaces and icons designed to improve readability and increase understanding of its content. Note the following examples:

- Standard text—used for regular information.
- **Boldface text**—emphasizes a word or phrase.
- **NOTE:**—sets apart special information or important instruction clarification.
- The symbol below highlights a WARNING or CAUTION:

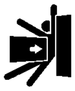
Figure 1-1. Warning and Caution



  - A WARNING identifies situations or actions that may affect patient or user safety. Disregarding a warning could result in patient or user injury.
  - A CAUTION points out special procedures or precautions that personnel must follow to avoid equipment damage.

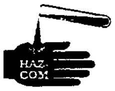
- The symbol below highlights a CAUGHT HAZARD WARNING:

Figure 1-2. Caught Hazard Warning



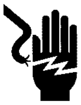
- The symbol below highlights a CHEMICAL HAZARD WARNING:

Figure 1-3. Chemical Hazard Warning



- The symbol below highlights an ELECTRICAL SHOCK HAZARD WARNING:

Figure 1-4. Electrical Shock Hazard Warning



Acronym List

There are several acronyms associated with the TotalCare® Bed System. For a list of acronyms, see table 1-1 on page 1-6

Table 1-1. Acronym List

Acronym	Definition
A/D	Analog-to-Digital
BPM	Bed Position Module
CLRT	Continuous Lateral Rotation Therapy
CPR	Cardiopulmonary Resuscitation
DPST	Double-Pole, Single-Throw
EEPROM	Electronic Erasable Programmable Read Only Memory
EPROM	Electronic Programmable Read Only Memory
ESD	Electrostatic Discharge or Electrical Static Discharge
FET	Solenoid Voltage Supervisor
FM	Footboard Module
FPGA	(Logic Control)
GCIM	Graphic Caregiver Interface Module
GDC	Graphic Display Controller
IFM	Intermediate Frame Module
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
LCD	Liquid Crystal Display or Liquid Crystal Diode
LED	Light Emitting Diode
LON	Local Operating Network

Acronym	Definition
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MUX	Multiplexer
NVRAM	Non-Volatile Random Access Memory
PACM	Power Assist Control Module
PAG	Amplifier/Indicator Board
PBM	Pulmonary Base Module
PCB	Printed Circuit Board
PCM	Power Control Module
PED	Patient Exit Detection
PIC	(Microcontroller type)
PM	Preventive Maintenance
PPM	Pulmonary Percussion Module
PRM	Pulmonary Rotation Module
PWM	Pulse Width Modulation
RAM	Random Access Memory
RAP	Repair Analysis Procedure
SCM	SideCom® Communication System Module
SM	Scale Module or Siderail Module
SPI	(Standard Industry Communication Protocol)
TFM	Treatment Foot Module
TFSCM	Treatment Foot Surface Control Module
TSCM	Treatment Surface Control Module
TSM	Treatment Surface Module

Acronym	Definition
TTM	Treatment Torso Module
UCM	User Control Module
VDE	Verband Deutscher Electrotechiker

Introduction

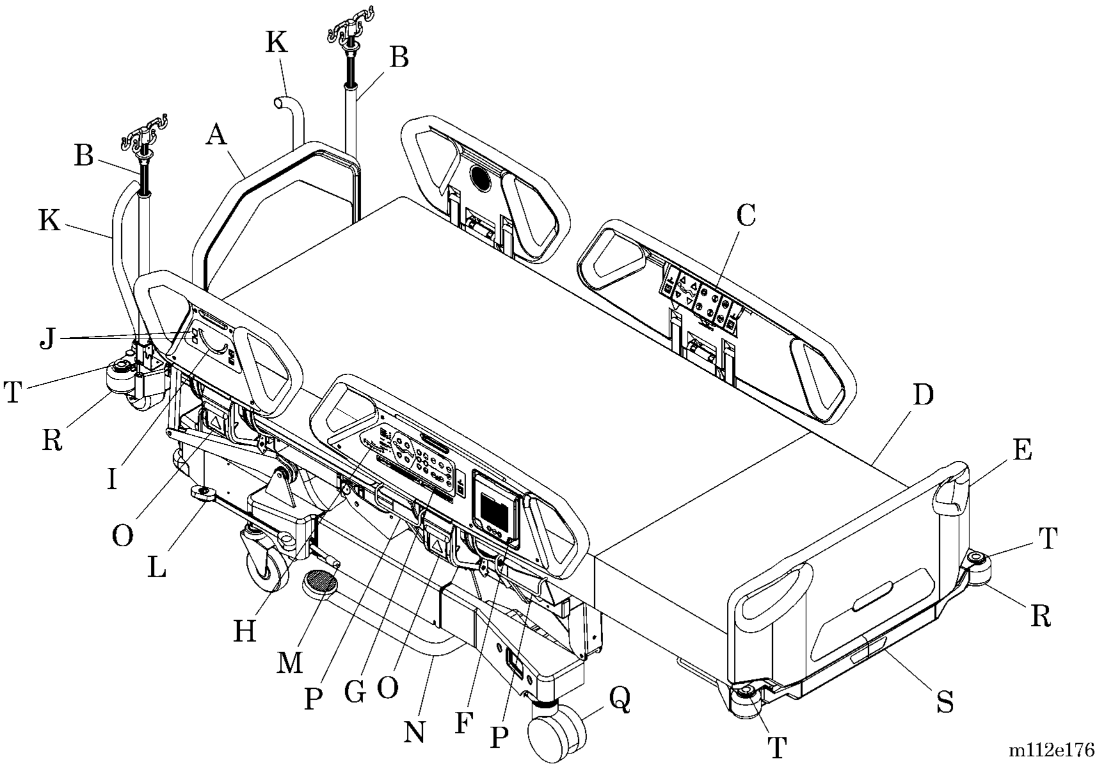
Overview

The TotalCare® Bed System is a comprehensive product ideally suited for acute patient care (see figure 1-5 on page 1-10). The TotalCare® Bed System provides, through its modular design, a one-product solution for acute care (including critical care), step down/progressive care, medical/surgical care, high acuity/subacute care, post anesthesia care, and certain emergency departments.

The TotalCare® Bed System consists of mechanical, hydraulic, air, and electrical systems that together comprise a base configuration of standard features, positioning and environmental controls, bed setup controls, and a sleep surface. Many options and accessories are available in a modular form which gives the TotalCare® Bed System significant application versatility.

The TotalCare® Bed System has both electric and optional manual controls. Low voltage switches operate the electric controls and are accessible to the caregiver and the patient. Manual controls enable bed operation during transport or when electric power is not available. The head, knee, foot, and bed up/down functions are easily operated through the hydraulic manual control.

Figure 1-5. TotalCare® Bed System



A	Removable headboard	K	Transport handles
B	Optional permanent IV pole	L	Point-of-Care® Brake and Steer System
C	Patient control panel	M	HandsFree® Emergency CPR/Trendelenburg Release Mechanism
D	Optional treatment surface	N	Optional foot pump
E	Removable footboard	O	OneStep® Siderail Release Mechanism
F	Optional Graphical Caregiver Interface (GCI)® Control	P	Drainage bag holders
G	Point-of-Care® Siderail Controls	Q	Optional 5" (12.7 cm) dual wheel casters
H	Line-of-Site® Trendelenburg Angle Indicator	R	WallGuard® Bumper System
I	Line-of-Site® Head Angle Indicator	S	Retractable and extendable foot section
J	Bed hilow controls	T	Equipment sockets

The TotalCare® Bed System enables the caregiver to easily transition the patient surface into numerous positions from either side (see figure 1-6 on page 1-11), (see figure 1-8 on page 1-12), (see figure 1-9 on page 1-13), (see figure 1-10 on page 1-14), (see figure 1-11 on page 1-14), (see figure 1-12 on page 1-15), and (see figure 1-13 on page 1-16). Through the use of selected siderail switches, the TotalCare® Bed System can be placed in a flat, chair, knee up or down, head up or down, extended foot, and retracted (in or out) foot up or foot down positions. Emergency CPR and Trendelenburg positions are quickly achieved by operating a single foot pedal accessible from either side.

Bed Positions

Figure 1-6. Chair Position

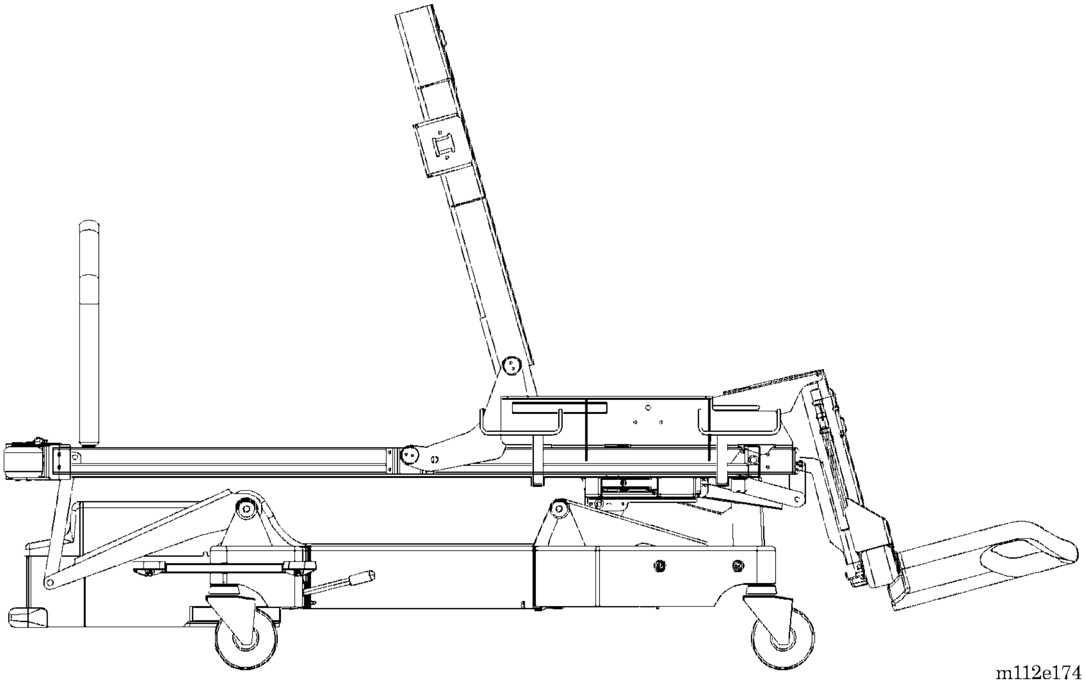


Figure 1-7. Chair Egress Position

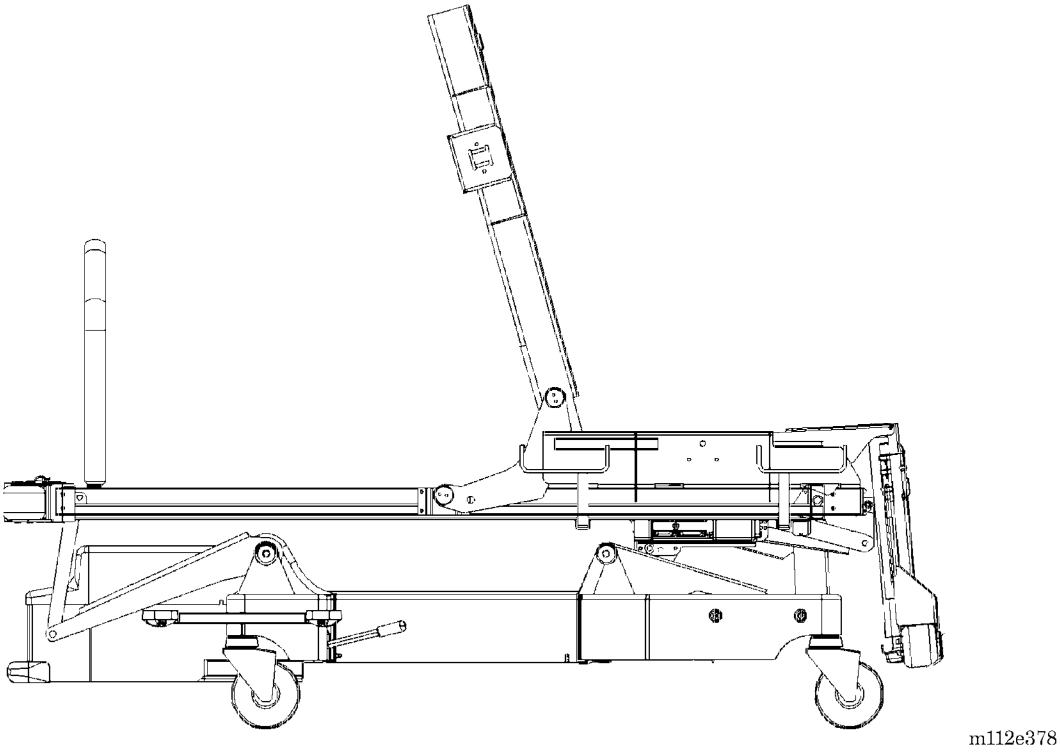


Figure 1-8. Recliner Position

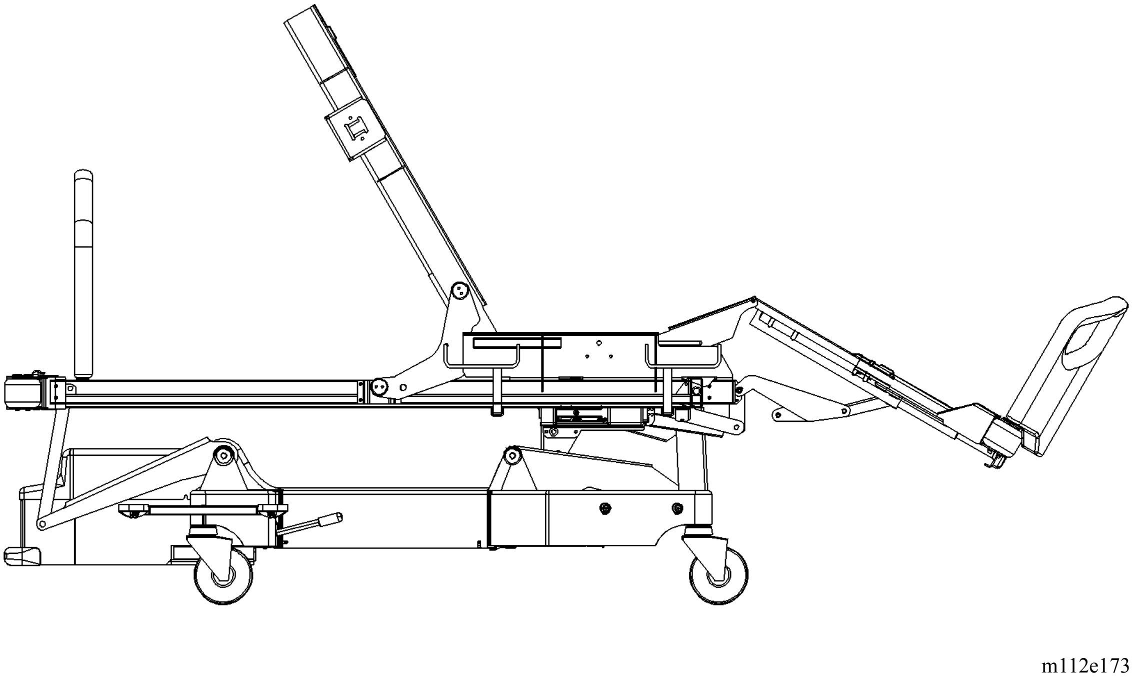
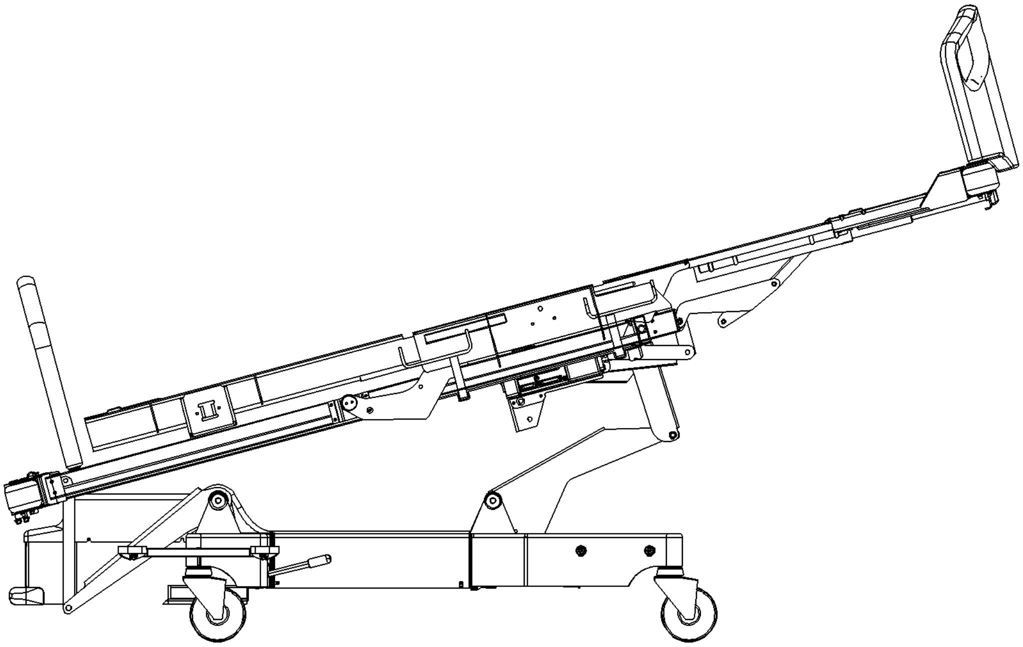


Figure 1-9. Trendelenburg/Reverse Trendelenburg Positions



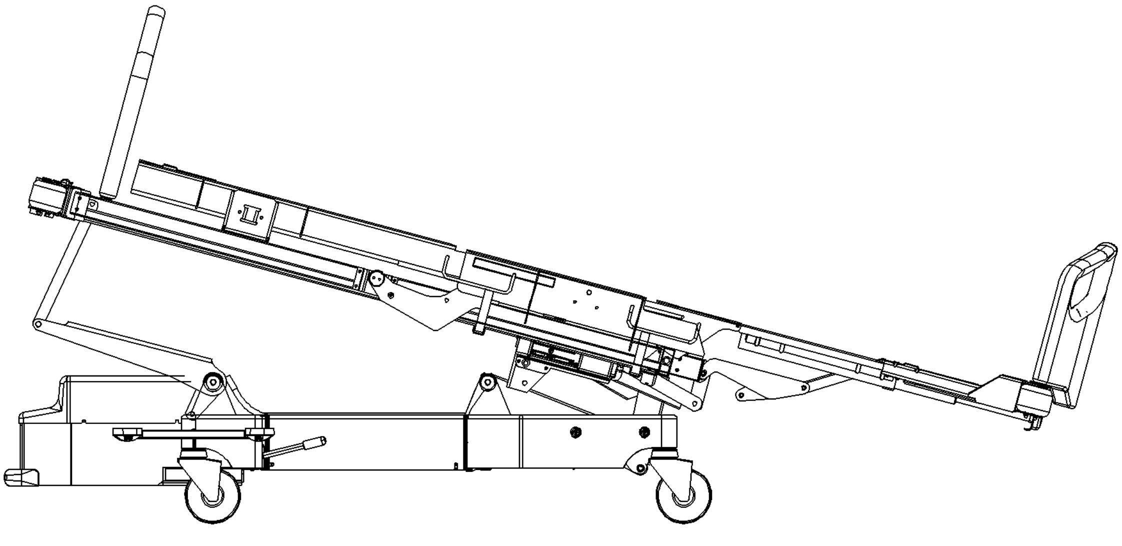


Figure 1-10. Foot Elevation Position

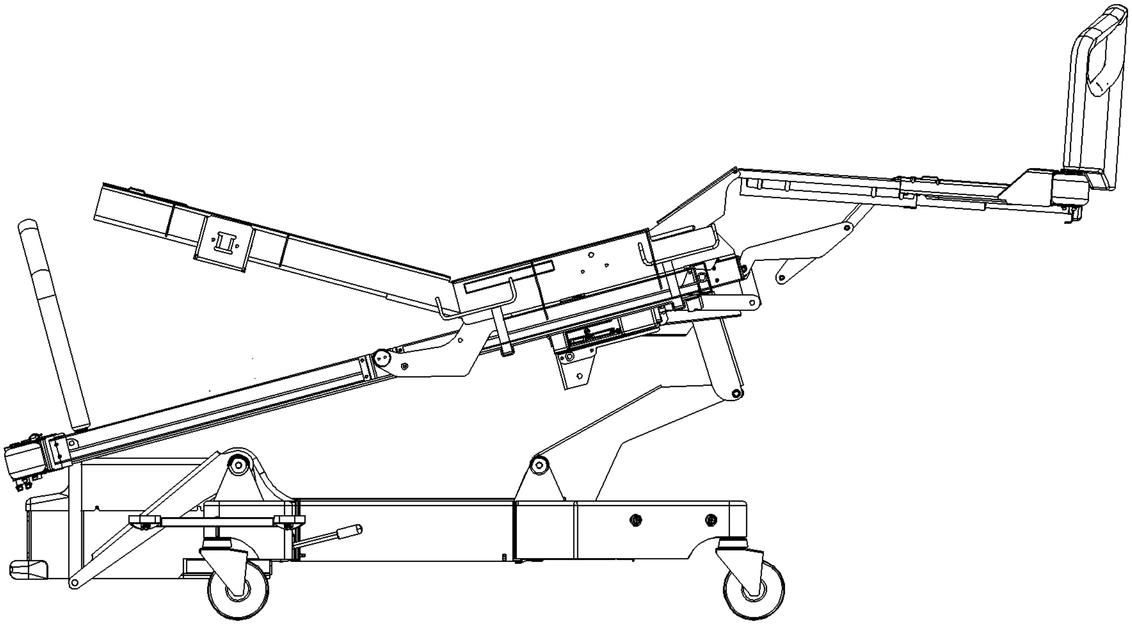


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Figure 1-11. Preliminary Tilt Table Position

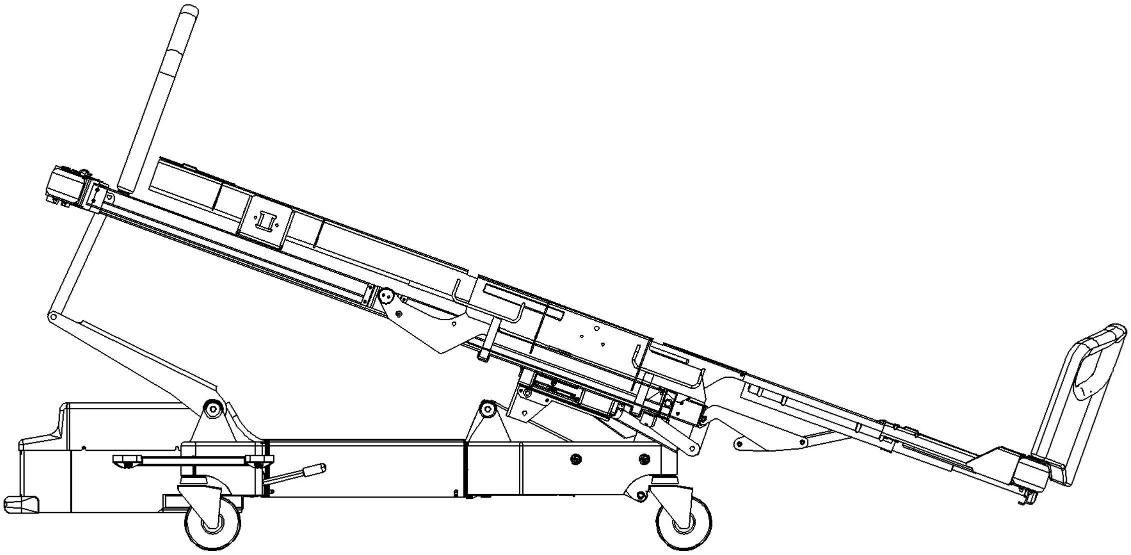

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Figure 1-12. Hilow Positions

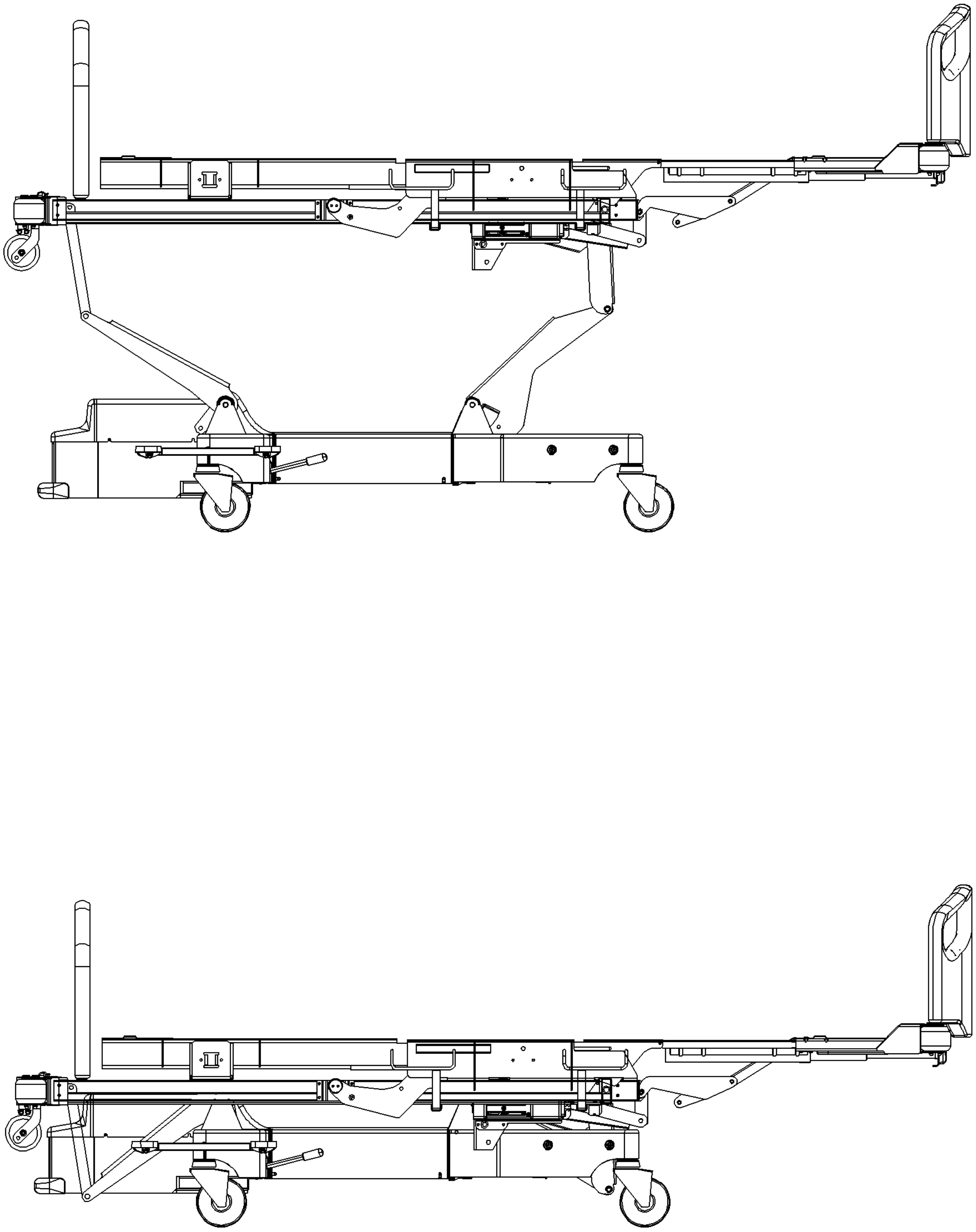


Figure 1-13. Head Up with Automatic Contour Position

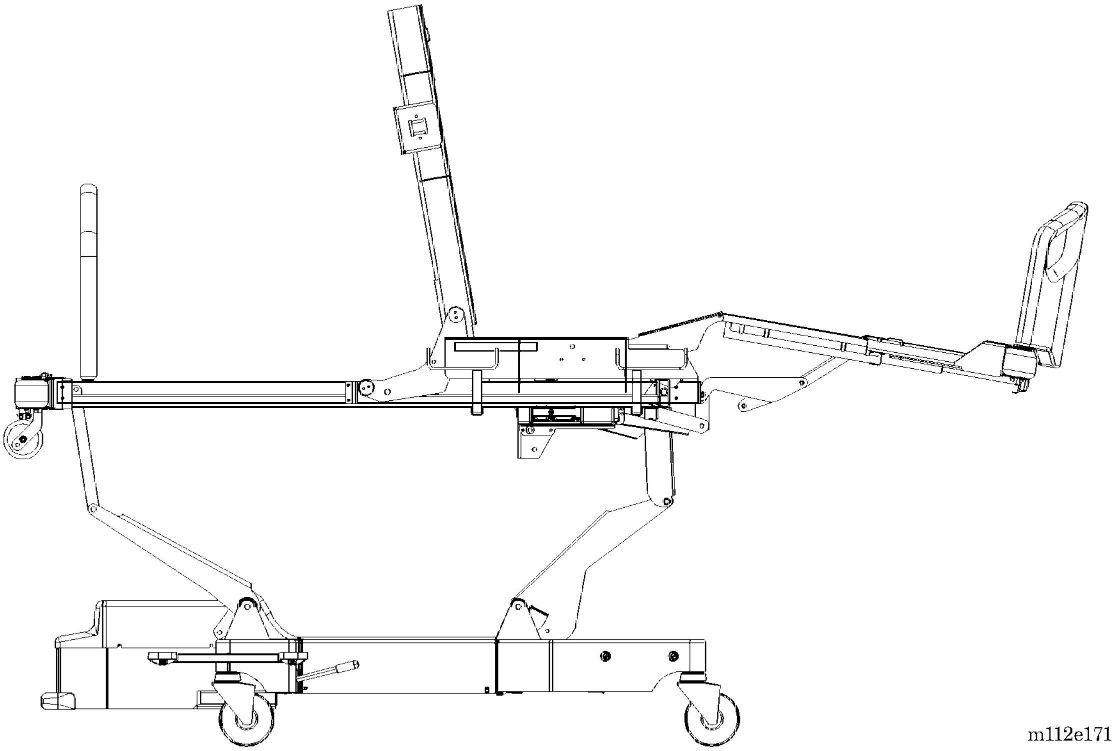
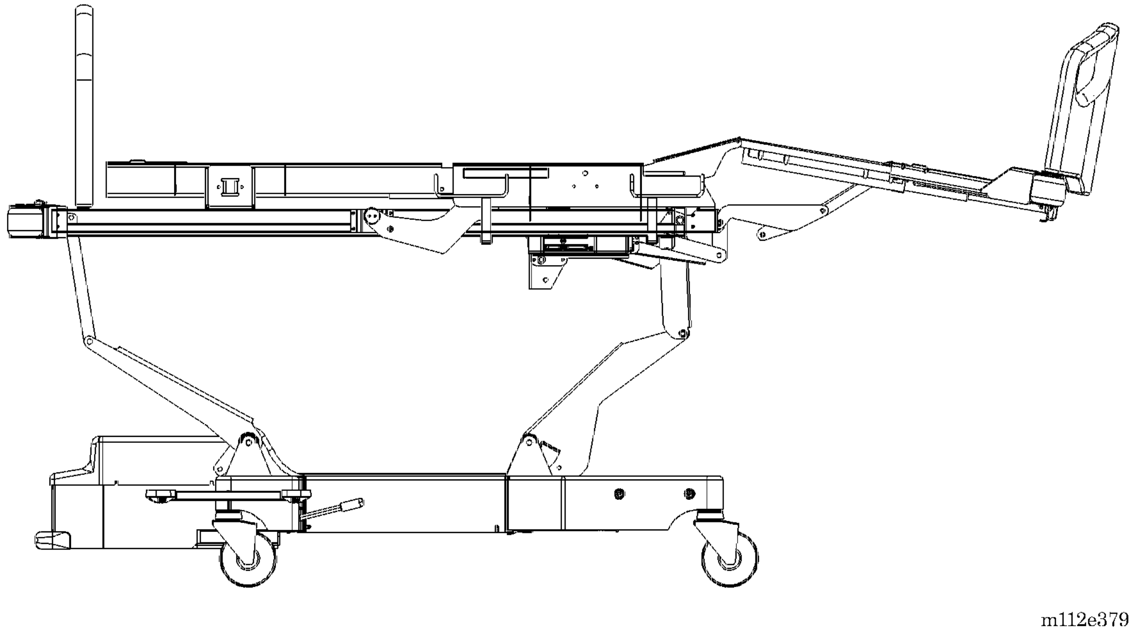


Figure 1-14. Knee Up Position



Operating Precautions

WARNING:
Driven bed mechanisms can cause serious injury. Do not operate bed controls until all persons are clear of mechanisms. A bed articulation function can be halted by releasing the control, pressing and holding the switch for the opposite function, or by unplugging the AC power cord.

Before you operate the bed, make sure to read and understand the contents of the *TotalCare® Bed System User Manual* and this manual. It is important that you read and strictly follow all safety guidelines in these manuals.

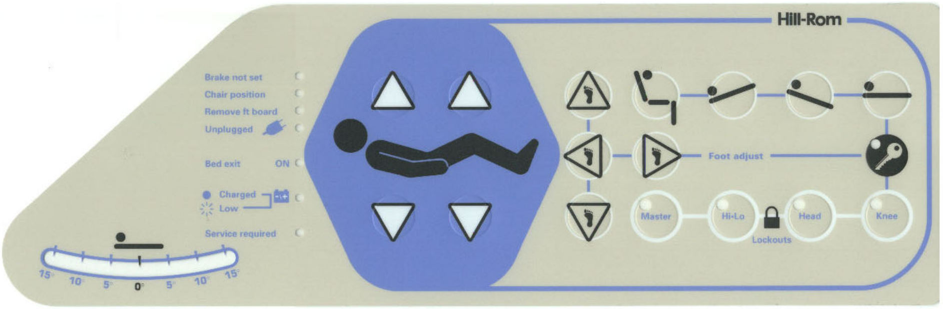
To help prevent falls by patients, always leave the bed in the **low** position; and set the brake when the patient is unattended.

Features

Standard Point-of-Care® Siderail Controls

Caregiver Point-of-Care® Siderail Controls are located on the outboard side of the intermediate siderails (see figure 1-15 on page 1-17).

Figure 1-15. Standard Point-of-Care® Siderail Controls

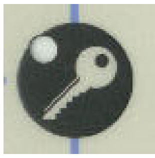

Hill-Rom
Brake not set
Chair position
Remove ft board
Unplugged
Bed exit
ON
Charged
Low
Service required
15°
10°
5°
0°
5°
10°
15°
Foot adjust
Master
Hi-Lo
Head
Knee
Lockouts

m112a159

Enable Key Control

The **Enable key** control deters unauthorized operation of certain user panel controls. After the **Enable key** control is pressed, the indicator light must illuminate before the intended caregiver control will operate. The **Enable key** indicator will stay on for 20 seconds when the **Enable key** control has been pressed. The **Enable key** is used to lock out certain operator functions. While this indicator light is on, the caregiver can activate all caregiver controls except for those that have been locked out (see figure 1-16 on page 1-18).

Figure 1-16. Enable Key Control



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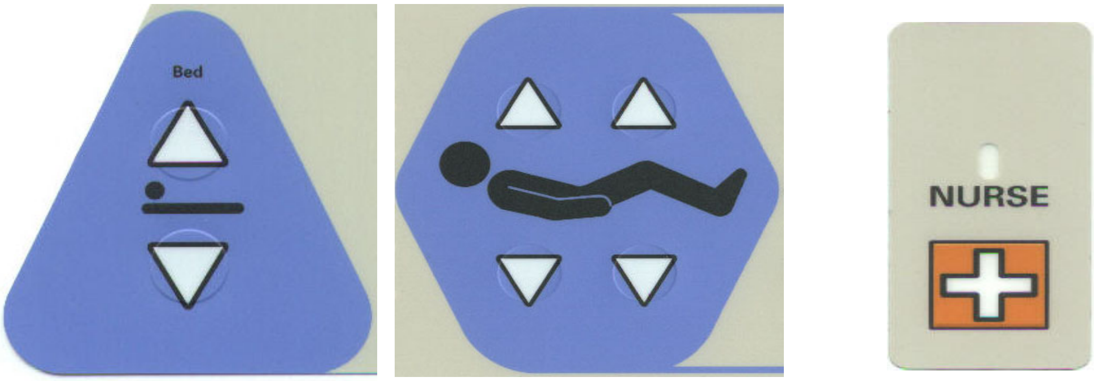
To Activate:

- Press the **Enable key** control; the **Enable key** indicator light comes on for 20 seconds.
- During the 20 second period, the caregiver may activate other caregiver controls without pressing the **Enable key** control again. The 20-second period starts over when another control is pressed.

The following controls do not require activation of the **Enable key** control: Bed **Up/Down**, Head **Up/Down**, Knee **Up/Down**, and **NURSE** controls (see figure 1-17 on page 1-18).

Figure 1-17. Controls Not Requiring Use of Enable Key Control



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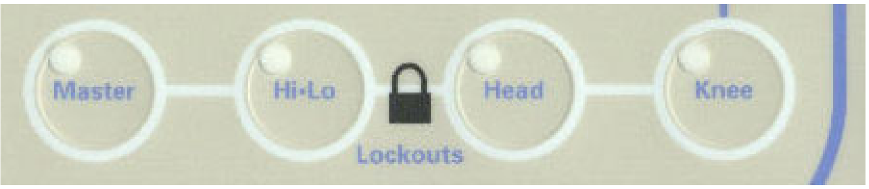
m112a206

Lockout Controls

The lockout controls located on the caregiver siderail control panel disable the bed system articulating functions (see figure 1-18 on page 1-19).

Figure 1-18. Lockout Controls



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To Activate:

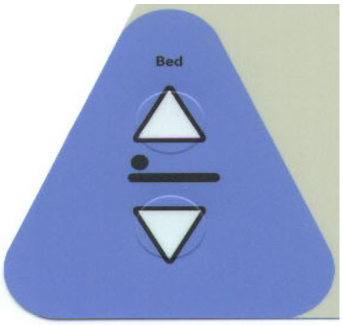
- Simultaneously press the **Enable key** control and the **Knee** Lockout control to lock out the Knee **Up/Down** controls. Both patient and caregiver Knee **Up/Down** controls will be locked out. An audible alarm sounds when a lockout is activated.
- Utilize the same procedure for the **Head**, **Hilow**, and **Master** lockouts.
- Disable any lockout by simultaneously pressing the **Enable key** control and the respective lockout control.

NOTE:
The **Master** lockout will disable all articulation controls. No movement of the system is allowed, except for emergency CPR and Trendelenburg functions.

Bed Up/Down (Hilow) Control

The TotalCare® Bed System adjusts in height from a low position for patient egress to a high position for examination. Use the Bed **Up/Down** controls to raise or lower the system (see figure 1-19 on page 1-19).

Figure 1-19. Bed Up/Down (Hilow) Control



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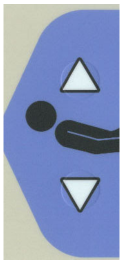
To Activate:

- Press and hold the Bed **Up** control to raise the system.
- Press and hold the Bed **Down** control to lower the system.

Head Up/Down Control

The caregiver can raise or lower the head section using the Head **Up/Down** controls (see figure 1-20 on page 1-20). Using the Line-of-Site® Angle Indicators, the caregiver can accurately articulate the head section to specific angles.

Figure 1-20. Head Up/Down Control



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It is important to distinguish between movement of the foot section with the movement of the automatic contour function, which is appropriate but may not be understood, and drift, which could occur independent of the intended operation of the bed functions. For example, if the head position is raised to a 45° position, then the foot section may experience up to a 10° downward movement. If desired, inhibit the automatic foot section movement by enabling the **Knee** lockout control. If downward drift **not** associated with the auto-contour function is suspected, properly test the bed to determine if the foot section is drifting downward more than the specified 3° in a 24-hour period (refer to “Function Checks” on page 2-10).

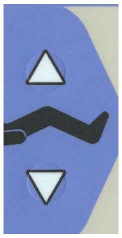
To Activate:

- Press and hold the Head **Up** control to raise the head section.
- Press and hold the Head **Down** control to lower the head section.
- Automatic Contour Feature—Press and hold a Head **Up** control. The head and knee sections rise together to reduce patient migration toward the foot end of the system.
- Disable Automatic Contour—Activate the **Knee** lockout control to disable the automatic contour mode.

Knee Up/Down Control

The caregiver can raise or lower the knee section using the Knee **Up/Down** controls (see figure 1-21 on page 1-21).

Figure 1-21. Knee Up/Down Control



To Activate:

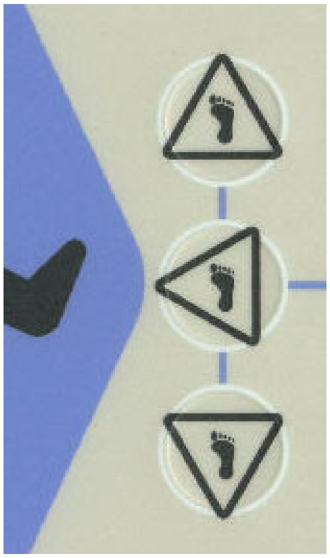
- Basic Knee **Up/Down**—Press and hold the Knee **Up** control to raise the knee section. Press and hold a Knee **Down** control to lower the knee section.
- Automatic Contour Feature—Press and hold a Head **Up** control. The head and knee sections rise together to reduce patient migration toward the foot end of the bed.
- Disable Automatic Contour—Activate the **Knee** lockout control to disable the automatic contour mode.

NOTE:
The automatic contour mode can be disabled by pressing and holding the Knee **Down** control while raising the head section.

Foot Up/Down Controls

The foot section can be lowered and raised using the Foot **Up/Down** controls (see figure 1-22 on page 1-22).

Figure 1-22. Foot Up/Down Controls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⚠ **WARNING:**
Before activating the foot section controls, make sure the area around the foot section is clear. Failure to do so could result in personal injury or equipment damage.

⚠ **WARNING:**
Do not activate this feature if a patient is in the bed and ankle restraints are in use. Injury to the patient could occur.

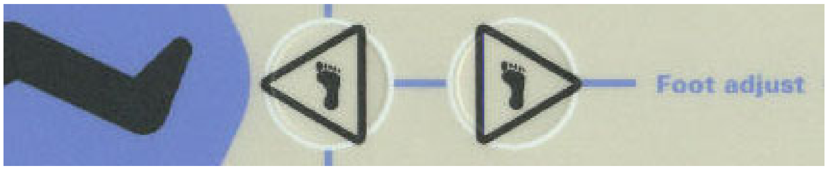
To Activate:

- Press the **Enable key** control.
- Press and hold the Foot **Down** control to lower the foot section. Press and hold the Foot **Up** control to raise the foot section.

FlexAfoot™ Retractable Foot Mechanism

The foot section can be extended or retracted using the foot retraction **In**/**Out** controls (see figure 1-23 on page 1-23). This feature allows the TotalCare® Bed System to customize the length of the sleep surface to the patient. The foot section can be retracted 12" (30 cm).

Figure 1-23. FlexAfoot™ Retractable Foot Mechanism



m112a211

WARNING:
Do not activate this feature if a patient is in the bed and ankle restraints are in use. Injury to the patient could occur.

NOTE:
Patient comfort can be affected by an improperly adjusted foot section. For additional information on heel suspension, see "Treatment Surface" on page 1-54.

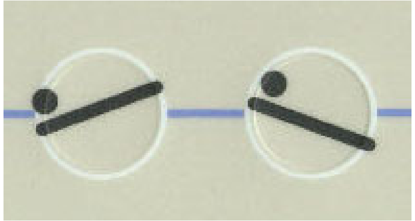
To Activate:

- Press the **Enable key** control.
- Press and hold the Foot **Out** control to extend the foot section. Press and hold the Foot **In** control to retract the foot section.

Trendelenburg and Reverse Trendelenburg Controls

The TotalCare® Bed System is capable of 15° Trendelenburg and 15° Reverse Trendelenburg. The powered Trendelenburg and Reverse Trendelenburg controls can be activated at any bed height (see figure 1-24 on page 1-23).

Figure 1-24. Trendelenburg and Reverse Trendelenburg Controls



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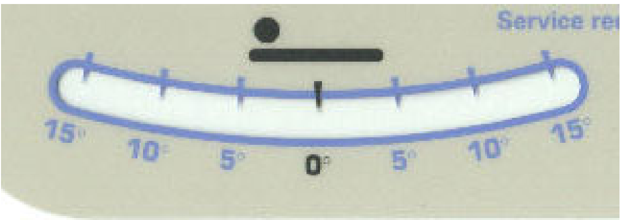
The Trendelenburg feature includes Line-of-Site™ Angle Indicators located in the intermediate siderails for determining Trendelenburg angles accurately (see figure 1-25 on page 1-24).

Figure 1-25. Line-of-Site® Angle Indicator



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NOTE:
If the head section is in the up position when Reverse Trendelenburg is activated, the head section automatically lowers. This keeps patients from gravitating forward. If necessary, the foot section will raise to avoid interference with the floor.

NOTE:
If the foot section is in the down position when Reverse Trendelenburg is activated, the foot section automatically rises. This prevents the foot section from interfering with the floor.

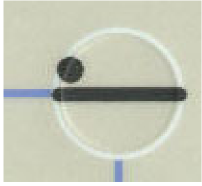
To Activate:

- Press the **Enable key** control.
- For Trendelenburg press and hold the **Trendelenburg** control. The foot end of the bed system articulating frame rises relative to the head end.
- For Reverse Trendelenburg press and hold the **Reverse Trendelenburg** control. The head end of the bed system articulating frame rises relative to the foot end.
- To Return to the flat position press the **Bed Flat** control. When the level position is reached, the bed system pauses.

Bed Flat Control

Bed Flat controls are provided so that a caregiver can easily return the patient deck to the level position from any other articulated position (see figure 1-26 on page 1-24).

Figure 1-26. Bed Flat Control



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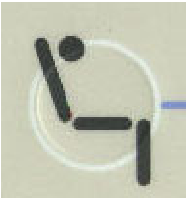
To Activate:

- Press the **Enable key** control.
- Press and hold the **Bed Flat** control. The patient deck will move to the flat position in a two-step motion: first the articulating frame and then the individual sections. When all sections are flat, the system will stop.

FullChair® Patient Position Mechanism

Using the **FullChair®** Patient Position Mechanism, the caregiver can place the TotalCare® Bed System in one of three basic chair positions (see figure 1-27 on page 1-25). The available chair positions are chair, chair egress, and recliner.

Figure 1-27. FullChair® Patient Position Mechanism



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The patient’s feet must be supported at all times while in the chair position. Using the optional foot bolsters or pillows as needed, the footboard can be reversed to provide support for the patient’s feet.

WARNING:
Do not activate this feature if a patient is in the bed, and ankle restraints are in use. Injury to the patient could occur.

WARNING:
If necessary, use the optional seat belt to prevent patients from sliding or falling forward while in a chair position.

WARNING:
Do not transport a patient if the TotalCare® Bed System is in a chair position. Injury to the patient could occur.

WARNING:
Do not stand or sit on the footboard, or personal injury could occur.

NOTE:
Patient articulation controls are automatically locked out while the system is in the chair or chair egress position.

Chair—The head section rises 65°, the knee section rises 10°, and the foot section lowers 70°.

The chair feature allows the caregiver to place the patient in a fully seated position without having to remove the patient from the TotalCare® Bed System. The chair feature also provides a means to support the patient's feet for comfort and security.

To Activate:

- Set the brake.
- Press the **Enable key** control.
- Press the **Chair** control. The patient deck transitions to the chair position.
- When the articulation pauses and an audible tone sounds, the system has reached the full chair position.

NOTE:
If the brake is not engaged when the system is in the chair or chair egress positions, the **Brake not set** indicator flashes, and an audible alarm periodically sounds.

To support the patient's feet:

- Check for support in the full chair position. Many patients are adequately supported with no action required.
- For shorter patients, reverse the footboard so that the product label is up.
- Adjust the foot section angle using the **Foot In** control to position the legs correctly while maintaining foot support.

NOTE:
Many shorter patients may not require that the footboard be reversed. Use of pillows, blankets, or an optional foot bolster may provide adequate support.

NOTE:
Extremely short patients may require use of pillows, blankets, or an optional foot bolster in addition to reversing the footboard for adequate foot support.

NOTE:
If the footboard is present with the bed in the maximum chair position, and the chair control or foot down control is pressed, the **Remove foot board** and **Chair** indicators flash, and an audible alarm sounds.

Chair Egress—The head section raises 75°, the knee section lowers to 0°, the foot section lowers 85°, and the bed lowers. The foot section fully retracts automatically.

The caregiver can use this feature to easily position a patient to egress from the foot end of the TotalCare® Bed System.

To Activate:

- Set the brake.
- Remove the footboard.
- Make sure the foot end casters are rotated toward the head end of the bed.
- Press the **Enable key** control.
- Press the **FullChair®** Patient Position Mechanism. The patient deck transitions to the egress chair position. Monitor the patient as the system moves to the egress position.
- Continue to hold the **FullChair®** Patient Position Mechanism until the full egress position is achieved.
- Assist the patient with egress.

NOTE:
If the brake is not engaged when the system is in the **Chair** or chair egress positions, the **Brake not set** indicator flashes, and an audible alarm periodically sounds.

NOTE:
The TotalCare® Bed System does not move to the full egress position until the footboard is removed. When the footboard is removed. The **Remove foot board** indicator light goes out.

NOTE:
The full egress position is intended to facilitate patient egress and not long-term sitting.

Recliner—The head section raises 50°, knee section raises 10°, and the foot section lowers 30°.

The recliner feature allows the patient to be placed in a customized semi-seated position.

To Activate:

- Set the brake.
- Press the **Enable key** control.
- Press the **Chair** control. The patient deck transitions to the reclined position.
- When the system has reached approximately the desired position, release the **Chair** control. If desired, use the Head, Knee, Foot, or Foot retract controls to make custom recliner position adjustments.

Point-of-Care® Brake and Steer System

The **Point-of-Care® Brake and Steer System** pedal control is located above the casters at the head end of the system. Use the steer mode to help move the TotalCare® Bed System in a straight line through hallways. Engaging the brake feature will keep the TotalCare® Bed System from moving. The neutral position allows the system to be moved sideways in a room or small enclosed area.

NOTE:
The TotalCare® Bed System should be pushed from the head end of the bed using the transport handles.

To Activate:

- To brake, step down on the **orange** brake pedal. The **Brake not set** indicator goes out, indicating the four casters are locked. Push and pull on the system to make sure that the brake function is fully engaged.
- To Steer, step down on the **green** steer pedal. The **Brake not set** indicator comes on. The two foot end casters lock in-line, ready for system movements.
- For the neutral position, move the brake/steer pedal to the level position. The **Brake not set** indicator comes on. The system can now be moved in any direction.

Emergency Caregiver Foot Controls

An **Emergency CPR** and an **Emergency Trendelenburg** control pedal is located on each side of the base frame between the head end and foot end casters.

HandsFree® Emergency CPR Release Mechanism—When connected to AC power, the CPR release lowers the head and knee sections, raises the foot section, and firms the optional treatment surface. The head and knee sections move to a flat position within 10 seconds. Emergency CPR is also functional in the full chair, chair egress, or recliner positions. When the pedal is held down for 4 seconds, an audible tone sounds, and the foot section rises. The foot section moves to a flat position within a maximum of 25 seconds if fully articulated. If the power cord is unplugged, only the head section lowers. To stop the automatic foot up articulation, press any control except for Hilow (Bed **Up/Down**), and the foot section will stop.

The optional treatment surface maximum inflates, providing a firm surface to support a CPR board. The headboard can be used as a CPR board in emergency situations. Should AC power be lost, the treatment surface maintains the level of pressure that existed at the time of power loss.

The system sounds an audible reminder alarm periodically when the treatment surface has been in the CPR mode for 15 minutes.

To Activate:

- Hold the **CPR** pedal down with your foot until the head section reaches the flat or desired position and the audible tone is heard.
- Release the **CPR** pedal to stop head section movement. The foot and knee sections automatically move to a flat position. The bed must be plugged in to do this.

NOTE:
If the pedal is held down for a minimum of 4 seconds, the foot section continues to move even if the pedal is released. The bed must be plugged in to do this.

NOTE:
The Bed **Up/Down** caregiver controls are usable when the CPR function is activated.

HandsFree® Emergency Trendelenburg Release Mechanism—Under normal power, the TotalCare® Bed System is capable of 15° Trendelenburg and 15° Reverse Trendelenburg. The Emergency Trendelenburg feature is capable of achieving up to a 20° angle if the system is in the full height position. However, the Line-of-Site® Trendelenburg Angle Indicators do not read angles larger than 15°.

To Activate:

- With your foot, **lift** and hold the **TREN** pedal. When the articulating frame has reached the full or desired Trendelenburg position, release the **TREN** pedal.
- If the articulating frame stops before the maximum 15° is achieved, raise the articulating frame higher using the Bed **Up** control.

NOTE:
The head section must be flat for the Emergency Trendelenburg feature to achieve the desired patient position.

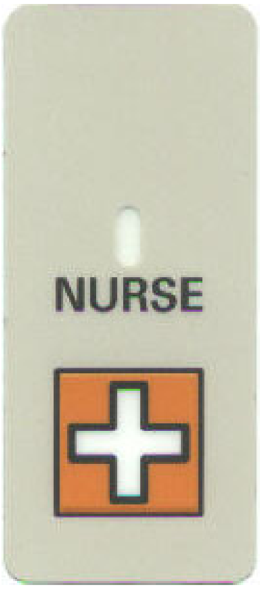
NOTE:
The overall angle of Emergency Trendelenburg is directly proportional to the overall height of the bed. To ensure that a maximum of 15° can be achieved during patient transport, the bed system should always be transported in a mid-height position.

Optional Point-of-Care® Siderail Controls

Nurse Call Control

On bed systems equipped with the nurse call option, use a **NURSE** control to activate the nurse call feature (see figure 1-28 on page 1-30). The controls are located on both the inboard and outboard sides of the intermediate siderails.

Figure 1-28. Nurse Call Control



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To Activate:

- Press a **NURSE** control. Beep sounds, indicating that a call signal to the nurse has been placed.
- When the nurses station acknowledges the nurse call, the indicator light on the **NURSE** control flashes.
- When the nurse station responds to the nurse call, the indicator stops flashing and illuminates continuously. The nurse station is now ready for communication.
- Speak into the speaker/microphone located on the inboard side of the head end siderails.

NOTE:
You do not need to press the **Enable key** control prior to pressing a **NURSE** control. The **NURSE** controls are always active. The **NURSE** controls cannot be locked out by the **Master** lockout control.

NOTE:
A nurse call is placed approximately 1 minute after the loss of AC power if the bed exit alarm is armed.

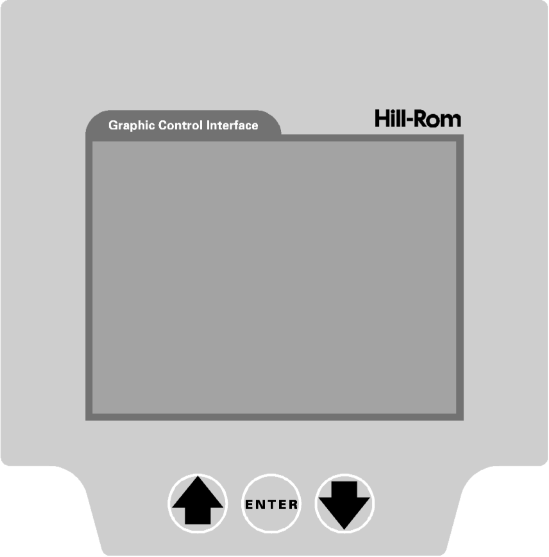
Graphical Caregiver Interface (GCI)® Control

The Graphical Caregiver Interface (GCI)® Control is an optional feature located on an intermediate siderail at the caregiver control panel (see figure 1-29 on page 1-32). The caregiver interacts with the Graphical Caregiver Interface (GCI)® Control through the use of three controls located at the bottom of the screen: the scroll **Up** arrow, **ENTER**, and the scroll **Down** arrow.

The Graphical Caregiver Interface (GCI)® Control utilizes a graphic display to enable full caregiver interaction. Menu choices appear on the right side of the screen. The left side of the screen displays unique information or instructions for the menu item highlighted on the right side of the screen.

Optional features that are present on a specific TotalCare® Bed System appear on the screen menus.

Figure 1-29. Graphical Caregiver Interface (GCI)® Control


Graphic Control Interface
Hill-Rom
ENTER

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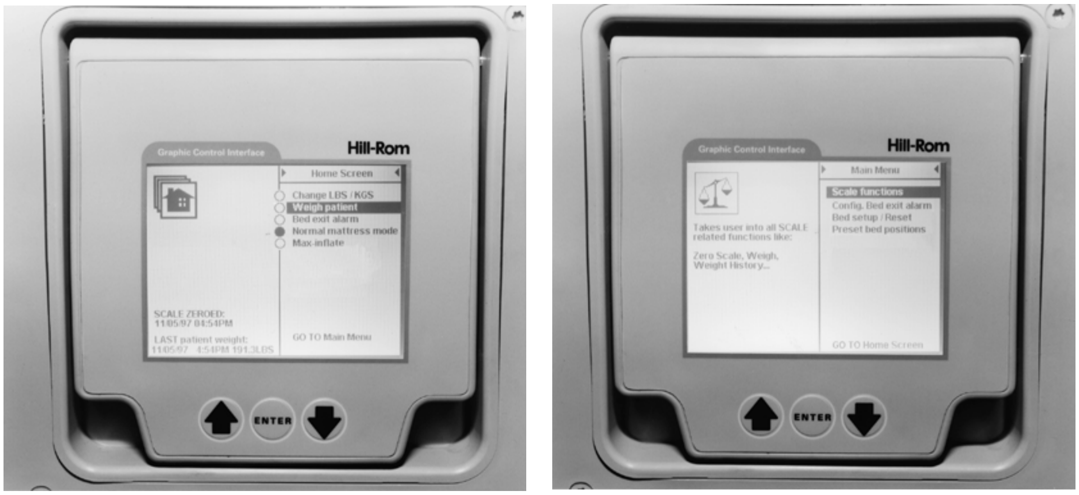
Generally, to operate system functions, the caregiver makes selections through the Home screen (see figure 1-30 on page 1-32) and (see figure 1-31 on page 1-33). Through the Home screen, the caregiver can also quickly access standard system functions (such as: Bed Exit alarm, weigh patient, and change LBS/KGS). Specific system setup or configuration functions are selected through the Main Menu (see figure 1-30 on page 1-32) and (see figure 1-33 on page 1-37).

Figure 1-30. Home Screen and Main Menu


Graphic Control Interface
Hill-Rom
Home Screen
○ Change LBS / KGS
○ Weigh patient
○ Bed exit alarm
● Normal mattress mode
○ Max-inflate
GO TO Main Menu
ENTER
Graphic Control Interface
Hill-Rom
Main Menu
Scale functions
Config. Bed exit alarm
Bed setup / Reset
Preset bed positions
GO TO Home Screen
ENTER

SCALE ZEROED:
11/05/97 04:54PM

LAST patient weight:
11/05/97 4:54PM 191.3LBS

Takes user into all SCALE related functions like:

Zero Scale, Weigh, Weight History...

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m112a230

The Graphical Caregiver Interface (GCI)® Control provides a service screen from which fault code data can be retrieved. To access the service screen, simultaneously press the **Up** arrow and **Down** arrow, and hold for approximately 15 seconds. For more information concerning the use of Graphical Caregiver Interface (GCI)® Control for service procedures, refer to chapter 2.

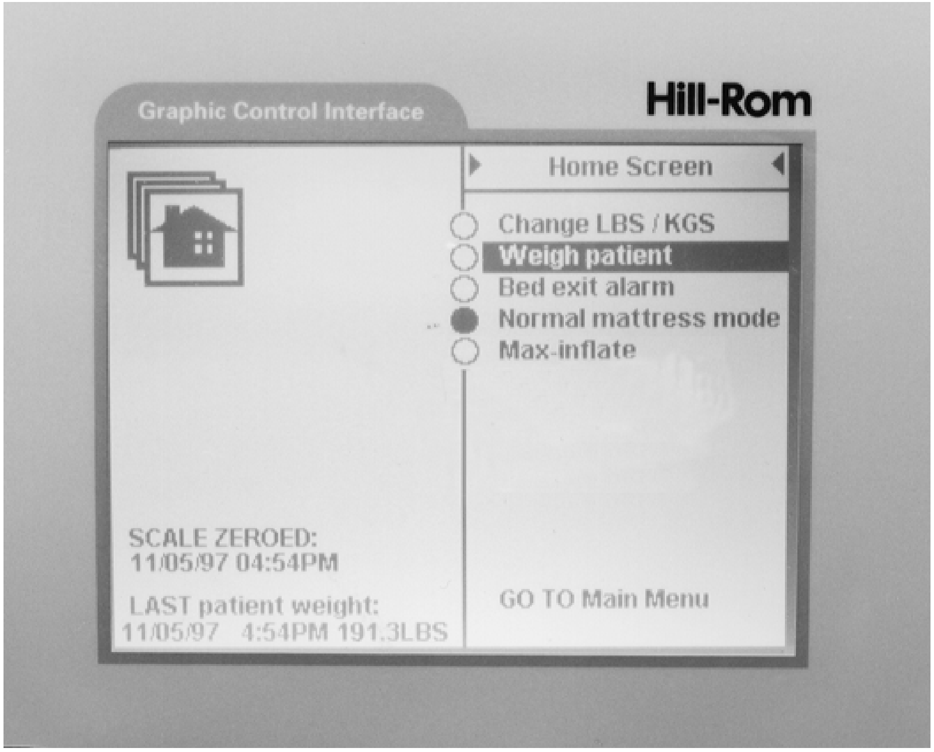
To Activate:

- Using the **Up/Down** controls, select the desired menu function. Begin selection at either the Home screen or the Main menu.
- Press the **ENTER** control.

NOTE:
After a menu selection has been made, and the system receives no further input, the Graphical Caregiver Interface (GCI)® Control eventually returns to the Home screen, and the screen turns off. To reactivate the Graphical Caregiver Interface (GCI)® Control, press the ENTER button or either the UP/DOWN arrows.

Home Screen

Figure 1-31. Home Screen


Graphic Control Interface
Hill-Rom
Home Screen
○ Change LBS / KGS
○ Weigh patient
○ Bed exit alarm
● Normal mattress mode
○ Max-inflate
GO TO Main Menu

SCALE ZEROED:
11/05/97 04:54PM
LAST patient weight:
11/05/97 4:54PM 191.3LBS

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Change LBS/KGS—To change the LBS/KGS, follow these steps:

1. From the Home screen, scroll to **Change LBS/KGS**. Press **ENTER**.
2. For additional scale functions, scroll to **Main Menu**. Press **ENTER**.
3. Scroll to **Scale functions**. Press **ENTER**.
4. Follow the on-screen instructions.

Weigh Patient—To weigh the patient, follow these steps:

1. Center the patient on the surface.
2. Raise the siderails.
3. Ensure the TotalCare® Bed System is clear of all obstructions: lines, tubing, walls, etc.
4. From the Graphical Caregiver Interface (GCI)® Control Home screen, scroll to **Weigh patient**. Press **ENTER**.
5. For additional Scale functions, scroll to **Main Menu**. Press **ENTER**.
6. Scroll to **Scale functions**. Press **ENTER**.
7. Follow the on-screen instructions.

NOTE:
To obtain accurate patient weight, the head and foot sections should be articulated to no more than 30°. Failure to place the bed within these limits will affect scale accuracy.

Bed Exit Alarm

NOTE:
The optional Bed Exit alarm does not activate if the patient is not on the bed. The minimum patient weight that allows the bed exit alarm to activate is 75 lbs.

To Activate:

1. At the Graphical Caregiver Interface (GCI)® Control home screen, scroll to **Bed Exit alarm**. Press **ENTER**. This activates the Bed Exit detection feature.

2. The **Bed Exit ON** indicator comes on to indicate that the Bed Exit detection feature is activated.
3. For additional Bed Exit alarm functions, scroll to **Main Menu**. Press **ENTER**.
4. Scroll to **Config. Bed Exit alarm**. Press **ENTER**.
5. Follow the on-screen instructions.

To Deactivate:

1. At the Graphical Caregiver Interface (GCI)® Control Home screen, scroll to **Bed Exit alarm**. Press **ENTER**. This deactivates the Bed Exit detection feature.
2. The **Bed Exit ON** indicator goes off to indicate that the Bed Exit detection feature has been deactivated.

The Bed Exit alarm can also be activated through the **Bed Exit alarm** panel located on the siderail opposite to the Graphical Caregiver Interface (GCI)® Control (see figure 1-32 on page 1-36).

To Activate the Alarm:

1. Press the **Enable key** control.
2. Press the **Alarm ON OFF** control.

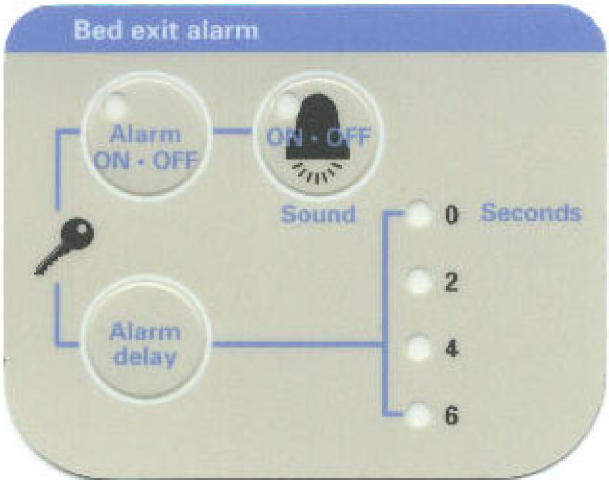
To Activate the Audible Alarm control (panel option):

1. Press the **Enable key** control.
2. Press the **Sound** control.

To Activate the Alarm Delay control:

1. Press the **Enable key** control.
2. Press the **Alarm delay** control.
3. Continue to press the **Alarm delay** control until the LED indicates the desired station (0, 2, 4, 6 seconds).

Figure 1-32. Bed Exit Alarm


Bed exit alarm
Alarm ON • OFF
ON • OFF
Sound
0
Seconds
2
4
6
Alarm delay
m112a217

Normal Mattress Mode

1. From the Home screen, scroll to **Normal mattress mode**.
2. Press **ENTER**. Follow the on-screen instructions.

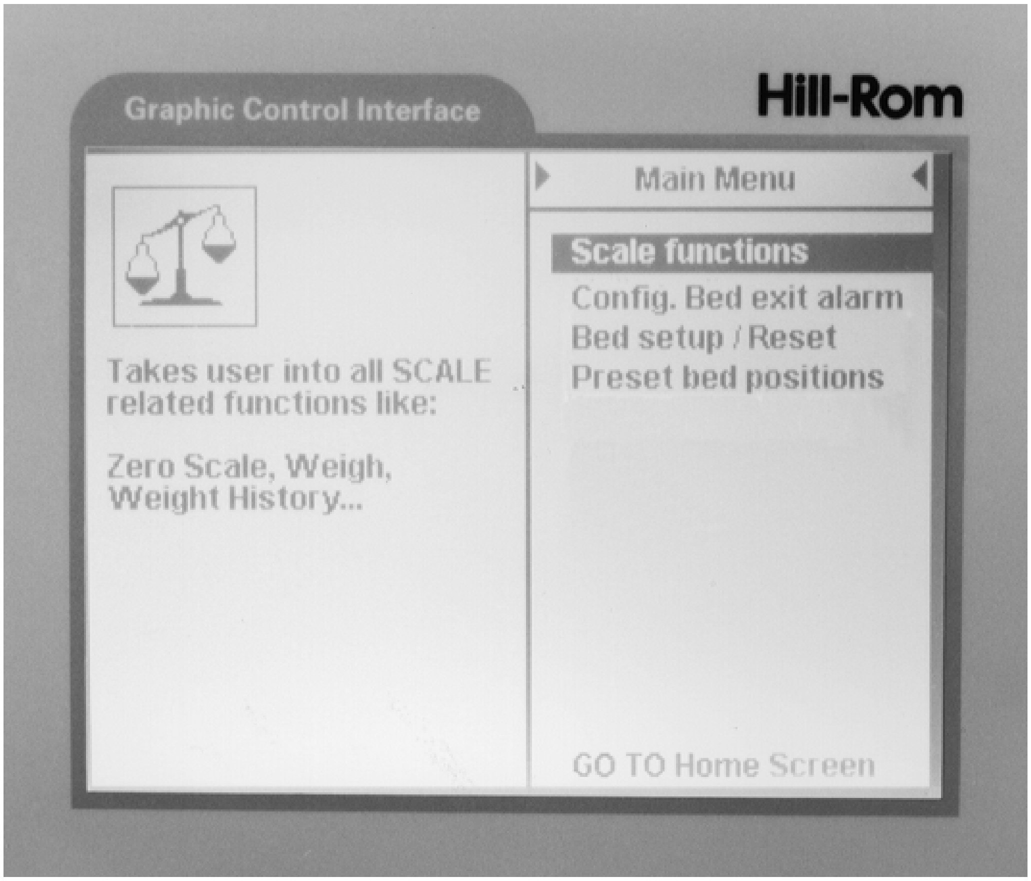
For additional information see “Treatment Surface” on page 1-54.

Max-inflate

1. From the home screen, scroll to **Max-inflate**.
2. Press **ENTER**.

For additional information see “Treatment Surface” on page 1-54.

Figure 1-33. Main Menu Screen


Graphic Control Interface
Hill-Rom
Main Menu
Scale functions
Config. Bed exit alarm
Bed setup / Reset
Preset bed positions
GO TO Home Screen

Takes user into all SCALE related functions like:

Zero Scale, Weigh, Weight History...

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At the Home screen, scroll to **GO TO Main Menu**. Press **ENTER**. The Graphical Caregiver Interface (GCI)® Control displays the Main Menu.

Scale Functions—Used to Zero Scale, Weigh patient, and retrieve Weight history

1. From the Main menu, scroll to **Scale functions**. Press **ENTER**. The Graphical Caregiver Interface (GCI)® Control displays the scale menu.
2. Scroll to desired function. Press **Enter**.

Config. Bed Exit Alarm—Used to access Change delay, Bed exit On/Off, Sound On/Off.

1. From the **Main menu**, scroll to **Config Bed exit alarm**.
2. Press **ENTER**.

Change Delay—Used to change delay time from 0, 2, 4, 6 s.

WARNING:
The activation of the 2, 4, or 6-second delay of the Bed Exit alarm feature reduces the effectiveness of the Bed Exit feature.

1. Scroll to **Change delay**. Press **ENTER**.
2. On the left side of the screen, scroll to either a **0**, **2**, **4**, or **6**-second alarm delay. Press **ENTER**. The filled circle indicates the selected delay duration.

Bed Exit On/Off—Used to turn Bed Exit alarm On/Off.

1. Scroll to **Bed exit: On/Off**. Press **ENTER**.
2. Select either **On** to activate the Bed Exit detection feature or **Off** to cancel the Bed Exit functions.

Sound On/Off—Used to turn Bed Exit Sound On/Off.

This affects only the audible alarm on the bed. A nurse call is still placed.

1. Scroll to **Sound On/Off**. Press **ENTER**.
2. Select either **On** for active audible indication or **Off** to cancel audible indication.

Bed Setup/Reset—Use to access Bed Reset, Set Time/Date, and Screen Contrast.

The **Bed setup/reset** control clears the Graphical Caregiver Interface (GCI)® Control weight history.

1. From the Main menu, scroll to **Bed setup/reset**.
2. Press **ENTER**.

Set Time and Date—To access Time and Date controls.

1. Scroll to **Set Time and Date**. Press **ENTER**.
2. Move the up and down arrows to change the time and date. Press **ENTER**.

Screen Contrast—Allows controls to change screen contrast.

1. Scroll to **Screen contrast**. Press **ENTER**. An arrow is highlighted on the left side of the screen.

2. Move the arrow up and down for lighter or darker settings. Press **ENTER**.

Preset Bed Positions—The Graphical Caregiver Interface (GCI)® Control is equipped with two preset system positions, Foot elevation, and Preliminary tilt table. Both positions can be activated through the Graphical Caregiver Interface (GCI)® Control.

Foot Elevation—The preset Foot elevation feature raises the patient's feet while lowering the head position.

1. From the **Main menu**, scroll to **Preset bed positions**. Press **ENTER**.

2. Select **Foot elevation,** and then press and hold **ENTER** until the patient is in the desired position.

Preliminary Tilt Table—The preset Preliminary tilt table feature will articulate the system to a maximum 20° Reverse Trendelenburg position.

1. From the **Main menu**, scroll to **Preset bed positions**. Press **ENTER**.

2. Select **Preliminary tilt table,** and then press and hold **ENTER** until the patient is in the desired position.

Manual Controls

Manual Foot Pedal—The caregiver can use the optional manual control to operate system articulation functions in the absence of AC power.

To Activate:

1. Press and hold the appropriate caregiver control while stepping down on the blue manual foot pedal repeatedly.

2. Continue until the desired position is achieved.

It is not necessary to use the hydraulic foot pump for any **down** functions except for Foot **Down**. Activate the appropriate caregiver control to activate down functions.

With the Treatment Surface option, there is a 30 second delay in activating manual foot pedal controls.

The following user panel controls require use of the bed systems **Enable key** Control: Foot Retraction, Foot Up/Down, Chair, Trendelenburg, and Reverse Trendelenburg.

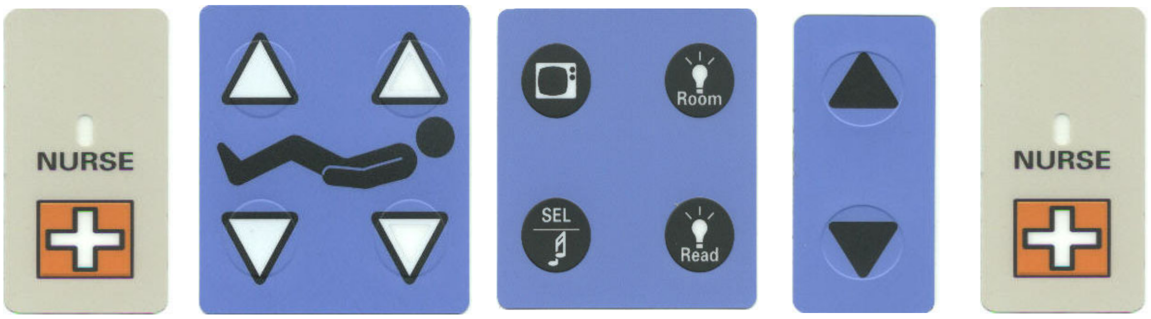
Optional Patient Controls

With the Patient Positioning Control option, patient controls are located on the inboard side of the intermediate siderails (see figure 1-34 on page 1-40).

NOTE:
The patient controls do not operate when AC power is unavailable. If the communication cable is plugged in, a nurse call will be placed approximately 45 seconds after loss of AC power if the bed exit alarm is set.

Figure 1-34. Optional Patient Controls

Nurse Call Patient Positioning Entertainment/Lighting/Enhanced Nurse Call



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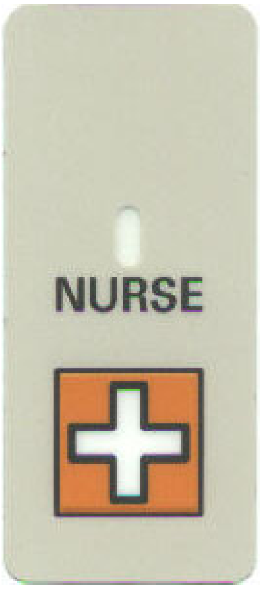
Nurse Call Control

On systems equipped with the nurse call option, **NURSE** controls are located on both the inboard and outboard sides of the intermediate siderails (see figure 1-35 on page 1-41). Operation of this feature is described in “Nurse Call Control” on page 1-30.

Figure 1-35. Nurse Call Control



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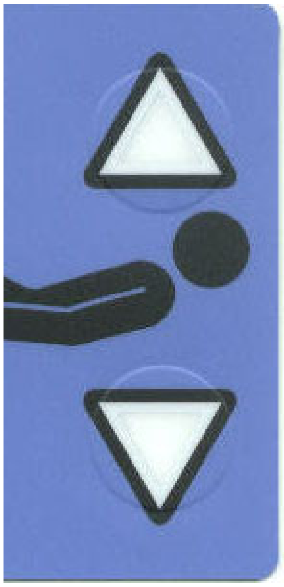
Use only Hill-Rom communications cables to ensure proper operation of the nurse call system.

Head Up/Down Control

The patient can raise or lower the head section using the Head **Up/Down** controls (see figure 1-36 on page 1-42). Operation of this feature is described in “Head Up/Down Control” on page 1-20.

NOTE:
When in chair mode, as indicated by an illuminated **Chair position** indicator, the optional Patient Positioning Controls are disabled.

Figure 1-36. Head Up/Down Control



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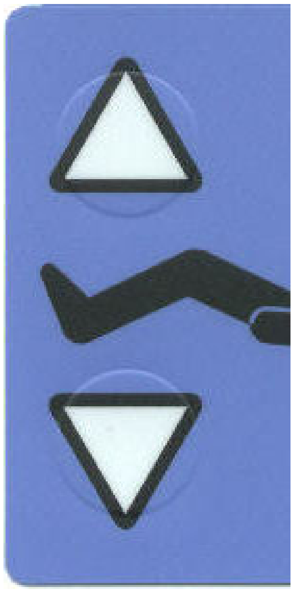
Knee Up/Down Control

The patient can raise or lower the knee section using the Knee **Up/Down** controls (see figure 1-37 on page 1-43). Operation of this feature is described in "Knee Up/Down Control" on page 1-21.

NOTE:
When in chair mode, as indicated by an illuminated **Chair position** indicator, the optional Patient Positioning Controls are disabled.

Figure 1-37. Knee Up/Down Control



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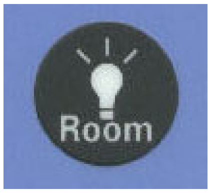
Room Light Control

The Room Light control is found on systems equipped with the Patient Lighting/Entertainment option (see figure 1-38 on page 1-43).

Figure 1-38. Room Light Control



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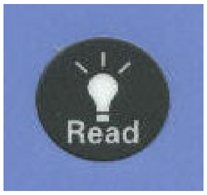
To Activate:

1. Press the **Room** control.
2. To deactivate the Room Light, press the **Room** control again.

Read Light Control

The Read Light control is found on systems equipped with the Patient Lighting/Entertainment option (see figure 1-39 on page 1-44).

Figure 1-39. Read Light Control



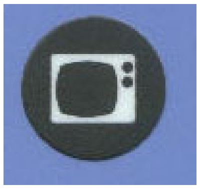
To Activate:

1. Press the **Read** control.
2. To deactivate the Read Light, press the **Read** control again.

Television Control

The Television control is found on systems equipped with the Patient Lighting/Entertainment option (see figure 1-40 on page 1-44).

Figure 1-40. Television Control



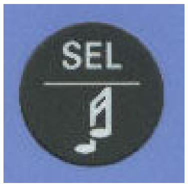
To Activate:

1. Press the **Television** control. Continue to press the control until the desired channel is obtained.
2. To deactivate the **Television**, press the **Television** control until the television turns off.

Music/Select Control

The Music/Select control is found on systems equipped with the Patient Lighting/Entertainment option (see figure 1-41 on page 1-45).

Figure 1-41. Music/Select Control



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To Activate:

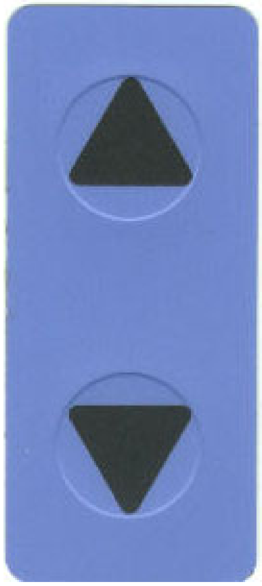
1. Press the **Music/Select** control.
2. To deactivate the Music, press the **Music/Select** control again.

NOTE:
When the system is equipped with the *enhanced* entertainment control option, the music/select control also functions as a TV menu select control.

Optional Enhanced Entertainment Control Option

These controls are found on systems equipped with the Enhanced Patient Lighting/Entertainment option (see figure 1-42 on page 1-45). Control functions vary depending upon the type of hospital entertainment available.

Figure 1-42. Up Arrow/Down Arrow



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Volume Control

Speaker volume is controlled using the volume slide bar located below the entertainment controls on the inside of the intermediate siderails.

To activate, slide the volume control bar in the desired direction to either increase or decrease speaker volume.

Standard Features

Head and Intermediate Siderails

TotalCare® Bed System siderails have been designed for one-step operation. This allows the caregiver a free hand for managing line.

Siderails in the raised position are intended to make the patient aware of the proximity of the edge of the sleep surface.

Siderails in the down position, below the patient surface, facilitates a patient's entry or exit from the bed system. This design feature also facilitates unobstructed access to the patient.

WARNING:
Siderails are not intended to be used as restraint devices. The appropriate medical personnel should determine the level of restraint necessary to ensure that a patient will remain safely in the bed system.

To raise a siderail, pull the siderail up until it latches into the locked position.

To lower a siderail, grasp the release handle and pull out. The siderail will automatically lower and tuck under the sleep surface perimeter.

Headboard

The headboard is located at the head end of the system. It attaches to the head end of the frame, and it articulates with the frame during system articulation.

The headboard can be removed for increased access to the patient's head. It also can be used as a back board during emergency CPR procedures.

A caregiver can quickly remove or attach the headboard in a single step without the use of tools.

To remove, grasp the headboard, and lift straight up.

To install, the headboard, position the headboard sockets over the pins on the frame. Then lower the headboard onto the pins. Push the headboard down until the bottom rests on the frame.

Footboard

The footboard is located at the foot end of the system. It attaches to the articulating foot section, and it remains perpendicular to the surface of the foot section at all times. The footboard provides patient protection during transport and room docking.

A caregiver can quickly remove or attach the footboard in a single step without the use of tools.

To remove, grasp the handles on the footboard, and lift straight up.

To install, insert the pins of the footboard into the blue sockets in the articulating frame. Push the footboard down until it rests on the deck.

Standard Casters

The TotalCare® Bed System comes equipped with 5" (13 cm) casters. The casters are integral components of the brake and steer system.

Transport Handles

Transport handles are provided at the head end of the TotalCare® Bed System. The handles provide the caregiver easy-to-grasp grips for steering and positioning the bed.

CAUTION:
Do not push or pull the TotalCare® Bed System by IV rods or other equipment. Use the transport handles or footboard. Damage to equipment can occur.

To Use:

1. Grasp the handles, and rotate them from their stored position.
2. When the handles drop and lock into position, they are ready for use.

To Store:

1. Grasp the handles and lift.

2. Rotate the handles to their stored position. The handles will drop slightly when they have reached the stored position.

Equipment Sockets

⚠ **WARNING:**
The equipment sockets are not to be used for overhead fracture frame equipment. Personal injury or equipment damage can occur.

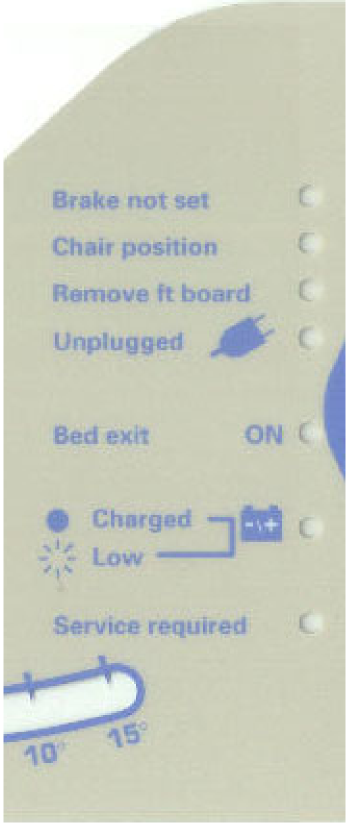
⚠ **WARNING:**
Before moving the TotalCare® Bed System into any of the chair positions, or articulating the foot section down more than 30°, remove all equipment from the sockets at the foot end of the articulating deck. Failure to do so could result in personal injury or equipment damage.

Equipment sockets are provided at each corner of the deck for equipment such as IV Rods and infusion support.

Safety and Information Indicators

Safety and Information Indicators provide the caregiver with visual and audio indications regarding Brake status, Chair positioning, Remove Ft board alarm, AC Power, Bed exit alarm, and Battery status (see figure 1-43 on page 1-49).

Figure 1-43. Safety and Information Indicators


Brake not set
Chair position
Remove ft board
Unplugged
Bed exit
ON
Charged
Low
Service required
10°
15°

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Brake Not Set—If the brake is not engaged, the Brake not set indicator flashes.

When activating the FullChair® Patient Position Mechanism, and the brake is not engaged, the **Brake not set** indicator flashes, and an audible alarm periodically sounds.

If the brake is not engaged when the system is in the chair or chair egress positions, the **Brake not set** indicator flashes, and an audible alarm periodically sounds.

Chair Position—The Chair position indicator comes on when the system is in the chair or chair egress position.

If the FullChair® Patient Position Mechanism is pressed and held to move to the chair egress position, and the footboard is installed, the **Remove ft board** indicator flashes, and a continuous audible alarm will sound.

If the brake is not set and the bed system is in chair or chair egress position, or the footboard is removed, the **Chair position** indicator flashes, and a periodic alarm sounds.

Remove Footboard—The Remove ft board indicator comes on, and an audible tone sounds to indicate that the footboard must be removed before the system can be changed to the chair egress position.

Unplugged AC—The Unplugged AC indicator comes on when the AC power cord is disconnected, and a battery is present.

Bed Exit (Optional)—The **Bed exit ON** indicator comes on when the Bed Exit detection feature has been activated.

Battery Power (Manual Control Option) Charged—If the system is equipped with the manual control option, or the treatment surface, or with SideCom® Communication System, the **Charged** indicator comes on when the battery is charged.

Low—If the system is equipped with the manual control option, the Low indicator flashes when the battery is low. An intermittent tone sounds for 30 seconds when the battery reaches the low condition.

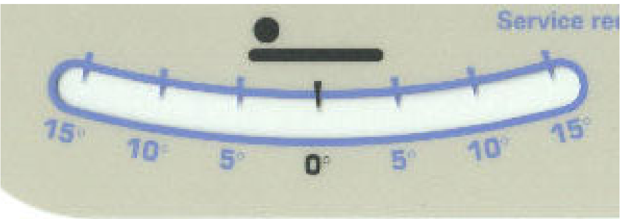
NOTE:
If the Battery Indicator changes from **Charged** to **Low** consistently within 4 hours of being disconnected from AC power, replace the battery.

Service Required—The **Service required** indicator flashes when the system detects a malfunction for an interpretation of a flashing indicator, refer to chapter 2.

Line-of-Site® Angle Indicator for the Trendelenburg Function

The Line-of-Site® Angle Indicator, located on the intermediate siderails, mechanically indicates up to 15° of Trendelenburg and 15° of Reverse Trendelenburg in 5° increments (see figure 1-44 on page 1-51). The degree number at which the indicator ball rests is the correct Trendelenburg angle.

Figure 1-44. Line-of-Site® Trendelenburg Angle Indicator



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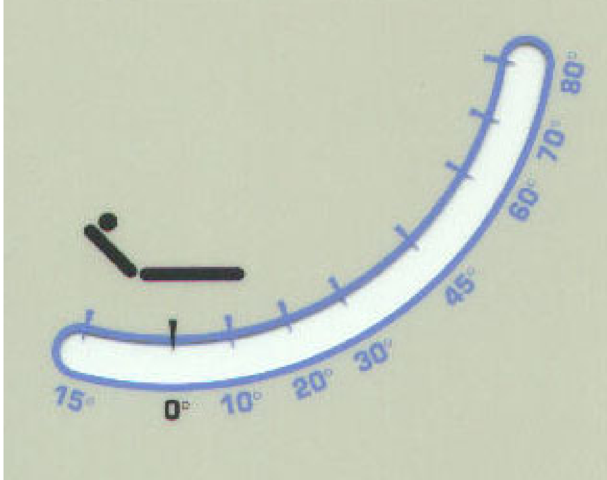
Patient Positioning Locator

A locator has been molded into the intermediate siderails to indicate the correct position of the patient's hips while on the bed system. The locator labels are on the inside of the intermediate siderail just below the head **Up/Down** controls on the patient control panel.

Line-of-Site® Head Angle Indicator

The head angle indicators mechanically indicate the angle of the head section from - 15° to + 80° (see figure 1-45 on page 1-51). The head siderails contain head angle indicators on their outboard sides.

Figure 1-45. Line-of-Site® Head Angle Indicator



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WallGuard® Bumper System

The WallGuard® Bumper System protects the perimeter of the TotalCare® Bed System when it is being moved or transported.

Roller bumpers protect the headwall system when the system is docked in the patient room.

IV Sockets

The TotalCare® Bed System comes with four standard IV sockets located on four corners of the articulating frame.

Drainage Bag Holders

The TotalCare® Bed System is equipped with six drainage bag holders, four centrally located at the side of the bed and two at the foot. Drainage bags should be placed on these holders.

The primary drainage bag holders *are not* located on the weigh frame. Secondary drainage bag holders, located on the sides of the foot section, are located on the weigh frame.

WARNING:
Do not tie restraints to drainage bag holders. Doing so could result in personal injury or equipment damage.

The holders accommodate any combination of the following drainage devices:

- Fecal incontinence bag
- 250/2000 ml Foley collection bag
- PLEUR-EVAC®[1] Drainage Device (during transport only)

NOTE:
When the bed system is docked, place the PLEUR-EVAC® Drainage Device or other chest drainage devices on the floor clear of the bed system to allow space for articulation.

Patient Restraint Interface

The TotalCare® Bed System facilitates vest, wrist, waist, and ankle restraint interface holders.

WARNING:
Patient restraints are not intended as substitutes for good nursing practices.

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[1] PLEUR-EVAC® is a registered trademark of Deknatel, Inc.

WARNING:
Restraints must be attached to the articulating sections of the system at the proper attachment points to prevent injury to the patient.

WARNING:
Never use ankle restraints in a chair position. Doing so could result in personal injury or equipment damage.

Alarms

The TotalCare® Bed System has both reminder and audible attention alarms.

- The reminder alarm generates two audible beeps.
- The attention alarm generates a continuous audible tone.

Reminder Alarms— Reminder alarms are generated in the following situations:

- After the Max-inflate mode (treatment surface option) has been active for 15 minutes, two audible beeps remind you that the Max-inflate mode is still active.
- When moving out of the **chair egress** position, two audible beeps remind you to install the footboard.
- When a lockout control is activated, two audible beeps are generated.
- When a nurse call is acknowledged, two audible beeps are generated.
- When operating on battery power, two audible beeps are generated every 2 minutes when the battery is in a low condition.

Attention Alarms—Attention alarms sound in the following situations:

- When there is a fault with the treatment surface system, a periodic audible alarm sounds.
- When the bed exit system is active, a continuous audible tone sounds after the selected delay to indicate a patient exit.
- When the brake is not set and the bed is in the chair or chair egress position, a continuous audible tone sounds to indicate that the brake is not set.

Optional Features

Short Stay Surface

The short stay surface is a, modular, three-layered, all-foam system with a viscoelastic core and foam-side bolsters. The short stay surface reduces pressure on the patient.

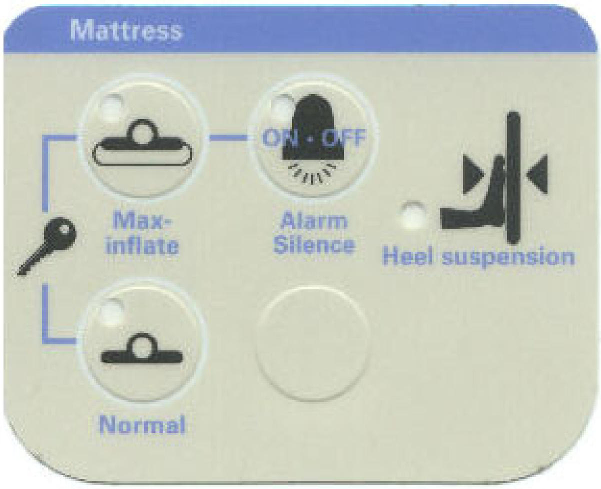
The TotalCare® Bed System surfaces are designed especially to work with the following system features:

- Step deck
- Shearless Pivot® Patient Position Mechanism
- FlexAfoot™ Retractable Foot Mechanism
- FullChair® Patient Position Mechanism
- FullChair® Patient Egress Position Mechanism

Treatment Surface

Treatment Surface Controls—The treatment surface controls are located on the intermediate siderails (see figure 1-46 on page 1-54).

Figure 1-46. Treatment Surface Controls



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Treatment Modes—There are three treatment modes: normal, max-inflate, and heel suspension.

Normal Treatment Mode—The normal mode of the optional treatment surface provides continuous full-body pressure relief. The surface relieves pressure by automatically adjusting the air system to accommodate changes in weight distribution. Additional pressure relief can be provided in the heel section. See "Heel Suspension Mode—The treatment surface mode also provides optimal pressure relief for the patient's heels. This mode is active when the foot section is retracted and the bed is not in the chair or chair egress positions. The patient's feet must always be positioned against the footboard for proper heel suspension. When the foot section has been retracted, the Heel suspension indicator will illuminate. Heel relief can be activated only by using the Foot Retract control." on page 1-56.

The normal treatment mode is always active unless:

- Max-inflate has been activated.
- AC power is not available.
- Power failure has occurred.

Refer to the Mattress control panel to determine the active treatment surface mode. An illuminated control indicates the active mode.

NOTE:
The optional treatment surface is not a substitute for good nursing practices. The treatment mode should be used in conjunction with good assessment and protocol.

WARNING:
Patients with body weight or length near the recommended limits should be monitored more frequently for desired results. Failure to do so could result in personal injury or equipment damage.

WARNING:
If a patient is at risk of heel breakdown, use the heel suspension mode. Failure to do so could result in personal injury.

To Activate:

- Press the **Enable key** control.
- Press the **Normal** control on the Mattress control panel.

Max-Inflate Mode—The max-inflate mode maximizes the firmness of the primary section of the patient surface. This assists in transferring the patient from one surface to another surface and in delivering CPR. If the bed system is not equipped with a Graphical Caregiver Interface (GCI)® Control, the max-inflate mode can be activated through the optional Mattress control panel or the HandsFree® Emergency CPR Release Mechanism.

NOTE:
When in the max-inflate mode, the bed system produces an audible tone after 15 minutes. If the max-inflate mode was activated through the use of the emergency CPR pedal, two audible beeps will sound 15 minutes after the emergency CPR mode was activated.

To Activate:

- Press the **Enable key** control.
- Press the **Max-Inflate** control on the Mattress control panel.

Heel Suspension Mode—The treatment surface mode also provides optimal pressure relief for the patient's heels. This mode is active when the foot section is retracted and the bed is not in the chair or chair egress positions. The patient's feet must always be positioned against the footboard for proper heel suspension. When the foot section has been retracted, the **Heel suspension** indicator will illuminate. Heel relief can be activated only by using the Foot Retract control.

WARNING:
The caregiver should assess the patient to ensure that the patient's heels are fully suspended. Failure to do so could result in personal injury or equipment damage.

To Activate:

- Press the **Enable key** control.
- Press the **Foot Retract** control on the Point-of-Care® Siderail Controls.

Alarm Silence Control—In the event of excessive air loss, pressure changes, or air system failure, the optional treatment surface initiates a continuous audible alarm. The **Service required** indicator (located on the caregiver control panel) also illuminates providing the caregiver with both a visual and audible indication of a potentially hazardous condition.

WARNING:
Hospital service personnel should be contacted immediately to assess and, if necessary, correct the failure. Failure to do so could result in personal injury or equipment damage.

To Silence the Alarm:

- Press the **Enable key** control.
- Press the **Alarm Silence** control on the Mattress control panel.

WARNING:
Excessive mattress pressure changes or air system failures could impact the pressure-relieving capability of the treatment surface. The Alarm Silence feature is not a substitute for good caregiver practice, and the patient should be constantly monitored. If necessary, the patient should be removed from the bed.

Once activated, the Alarm Silence control silences the audible alarm for 8 hours. Continuous patient assessment and protocol is necessary to determine if the patient should be removed from the bed. The **Service required** indicator (see figure 1-43 on page 1-49) remains illuminated until the failure has been corrected. The audible alarm activates again after 8 hours until the failure has been corrected.

Control Panel Indicator Lights—Treatment Surface

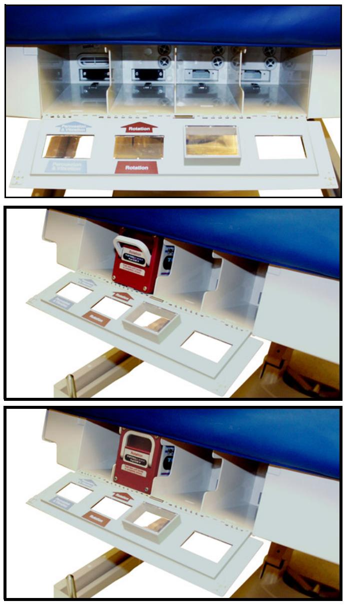
The Max-inflate indicator comes on when the treatment surface is pressurized and inflated to the maximum.

The Normal indicator comes on when the treatment surface is in the normal operating mode.

The Heel suspension indicator comes on when the heel suspension surface mode is activated.

The Alarm Silence indicator comes on when the alarm is silenced.

TotalCare SpO$_2$RT® Pulmonary Therapy System



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To Install the Rotation and/or Percussion and Vibration Modules:

- Remove the headboard.
- Raise the head section to a minimum of 15°.
- Open the manifold door located at the head of the bed under the sleep surface.
- Locate the appropriate slot for the required module (Rotation or Percussion and Vibration).
- Grasp the module by the handle, and slide it into the manifold.
- Gently push on the module until it snaps into place. The handle will not fold into the box if the module is not completely engaged into the manifold. Therapy will not start if the module is not fully engaged in position.
- Close the manifold door. The door will not close unless the module handle is folded into the module.
- Install the headboard.
- Once the module is installed, the Graphical Caregiver Interface (GCI)® Control and the siderail will indicate that the module is installed.
- Therapy can be activated by accessing the Pulmonary Menu in the Graphical Caregiver Interface (GCI)® Control.

To Remove the Rotation and/or Percussion and Vibration Modules:

- Using the Graphical Caregiver Interface (GCI)® Control, turn off the pulmonary therapy, if active.
- Raise the head section to a minimum of 15°.
- Remove the headboard.
- Open the manifold door at the head of bed under the sleep surface.
- Grasp the handle on the module, and pull downward. This will release the module from the locked position.
- Remove the module from the manifold.
- Close the manifold door hatch.
- Install the headboard.
- Once the module is removed, the Graphical Caregiver Interface (GCI)® Control screen and the siderail will indicate that the module is removed.

⚠ **WARNING:**
Excessive leakage currents may occur if recessed terminals in the manifold compartment and the patient are touched simultaneously.

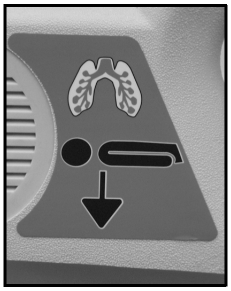
TotalCare SpO$_2$RT® Pulmonary Therapy System Mattress CPR Function

When the CPR function is activated, the surface will go into Max-inflate. A cardiac arrest board is recommended. After 30 minutes of Max-inflate, the mattress will automatically go into normal mode. This is a non-rotation/percussion/vibration mode that provides pressure relief. This change in pressures will not alter the effectiveness of CPR.

To discontinue Max-Inflate function from the CPR mode, press Resume to return to normal mode.

Rotational Therapy

Prior to activating the rotation mode, align the patient's shoulders with the label on the inside, upper siderail. This will ensure proper placement of the patient on the surface to receive maximum benefits. The top cushion is designed to support the head for pressure relief and comfort. No pillow is necessary.



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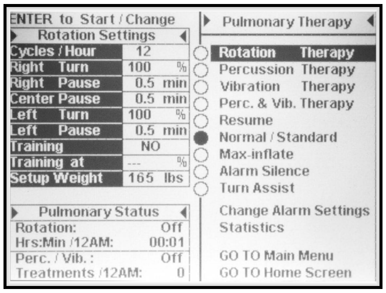
The rotation mode provides gentle, side-to-side, continuous lateral rotation therapy (CLRT) for the prevention of pulmonary complications related to immobility. Patients can be positioned laterally on the right or left side with varying amounts of turn and pause times to match each individual patient's condition. Pressure relief is provided when the rotation mode is active.

Rotation therapy option will not work unless the rotation module is installed. The surface will still provide turn assist without the module being installed.

WARNING:
Observe lines closely during rotations. Always use good line management techniques to prevent lines and tubing from becoming dislodged during rotation.

To Initiate Rotation Therapy:

- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or the UP or DOWN button to activate the screen.
- From the Home Screen, scroll to Rotation/Perc./Vib. Press ENTER. The Pulmonary Therapy Screen is now displayed.



ENTER to Start / Change

Rotation Settings

Cycles / Hour	12
Right Turn	100 %
Right Pause	0.5 min
Center Pause	0.5 min
Left Turn	100 %
Left Pause	0.5 min
Training	NO
Training at	--- %
Setup Weight	165 lbs

Pulmonary Status

Rotation:	Off
Hrs:Min /12AM:	00:01
Perc. / Vib. :	Off
Treatments /12AM:	0

Pulmonary Therapy

○ Rotation Therapy
○ Percussion Therapy
○ Vibration Therapy
○ Perc. & Vib. Therapy
○ Resume
● Normal / Standard
○ Max-inflate
○ Alarm Silence
○ Turn Assist

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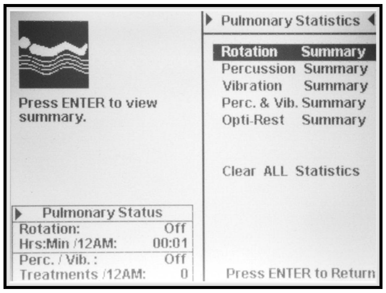
Press ENTER to view summary.
Pulmonary Statistics
Rotation Summary
Percussion Summary
Vibration Summary
Perc. & Vib. Summary
Opti-Rest Summary
Clear ALL Statistics
Press ENTER to Return

Pulmonary Status
Rotation: Off
Hrs:Min /12AM: 00:01
Perc. / Vib. : Off
Treatments /12AM: 0

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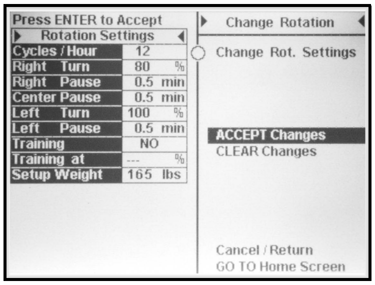
- Scroll to Rotation Therapy. Press ENTER.
- Review the therapy settings at the left. If the settings are acceptable, select Start Rotation. Press ENTER.

The following values can be customized:

- Cycles per hour: Depends on pause times (automatically calculated)
- Right turn %: Customize the amount of turn to the right
- Right pause: Amount of time in side-lying position
- Center pause: Amount of time centered in middle
- Left turn %: Customize the amount of turn to the left side
- Left pause: Amount of time in side-lying position
- Training: Yes/No (Starts rotation at 50% of maximum programmed turn and increases 10% each hour for patient acclimation)
- Set up weight: Enter patient weight for rotation therapy set up (automatically updates when weighing patients using the scale feature)

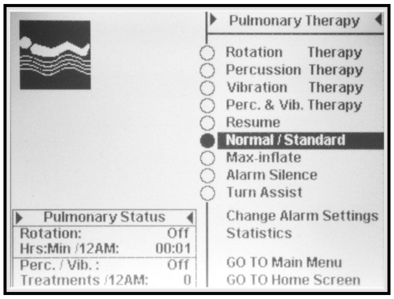
To Change Settings:


Press ENTER to Accept
Change Rotation
○ Change Rot. Settings
ACCEPT Changes
CLEAR Changes
Cancel / Return
GO TO Home Screen

Rotation Settings
Cycles / Hour 12
Right Turn 80 %
Right Pause 0.5 min
Center Pause 0.5 min
Left Turn 100 %
Left Pause 0.5 min
Training NO
Training at --- %
Setup Weight 165 lbs

m112c316

- Scroll to Change Rot. Settings. Press ENTER. Press ENTER again. This confirms the desire to change the settings.
- The icon moves to Rotation Settings on upper left screen. Use Up/Down arrows to adjust values. Press ENTER to go to the next setting.
- Continue making changes, using Up/Down arrows and the ENTER key until all changes are made.
- Icon moves to Accept Changes. Press ENTER if acceptable.
- If the rotation therapy is not going to be used at the time of setting, press ENTER, then release the Graphical Caregiver Interface (GCI)® Control or select GO TO Home Screen for other options.
- If not acceptable, scroll to Change Settings, Clear, Cancel/Return, press ENTER.


Pulmonary Therapy
○ Rotation Therapy
○ Percussion Therapy
○ Vibration Therapy
○ Perc. & Vib. Therapy
○ Resume
● Normal / Standard
○ Max-inflate
○ Alarm Silence
○ Turn Assist
Change Alarm Settings
Statistics
GO TO Main Menu
GO TO Home Screen
Pulmonary Status

Rotation: Off
Hrs:Min /12AM: 00:01
Perc. / Vib.: Off
Treatments /12AM: 0

m112c317

To Stop Rotational Therapy:

- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or either the UP or DOWN button to activate the screen.
- From the Home Screen, Main Menu, or Rotation/ Perc./Vib screen, scroll to Normal/Standard. Press ENTER.
- On the siderail opposite the Graphical Caregiver Interface (GCI)® Control, press the Enable control and Normal/Standard control.

Rotation Reminders:

- Rotation therapy will be suspended when:
- Any siderail is lowered. To restart rotation - raise siderail to upright position.
- Head of Bed (HOB) is raised higher than 40 degrees. To restart rotation - lower HOB.
- Foot of Bed (FOB) is lowered more than 30 degrees. To restart rotation - raise FOB.
- Chair position is entered. To restart rotation - exit chair position.
- Percussion/Vibration, Max-inflate, or Turn Assist is active.
- The Therapy Suspended light on the siderail will blink when therapy has been suspended for any of the above conditions.
- Use Alarm Silence (located on Graphical Caregiver Interface (GCI)® screen or the opposite siderail panel) to turn off any audible alarms.
- Check the Graphical Caregiver Interface (GCI)® screen if you are uncertain why the bed is alarming - the reason will be displayed on the Graphical Caregiver Interface (GCI)® screen.
- Pulmonary Status is shown in the lower left corner. This shows: hrs/mins. rotated since 12 am., active, off or not installed.

Percussion and/or Vibration Therapies

Percussion is the clapping of the posterial chest wall to loosen secretions in the lungs.

Vibration, or shaking, of the posterial chest wall helps move lung secretions for easier removal.

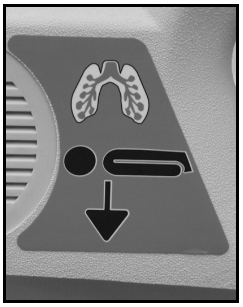
The percussion and vibration therapies can be done separately or together as a sequential treatment.

Treatments can be done with the patient in the supine or the right or left side lying positions to facilitate postural drainage or in conjunction with CLRT.

Use the same treatment parameters as for manual percussion/vibration regarding frequency, duration, as directed by physicians orders.

The percussion and vibration therapy options will not work unless the percussion and vibration module is installed.

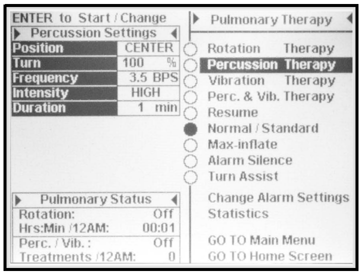
Prior to activating the Percussion and Vibration Modes, align the patient's shoulders with the label on the inside, upper siderail. This ensures proper placement of the patient on the surface to receive maximum benefits. The top cushion is designed to support the head for pressure relief and comfort. No pillow is necessary.



m112c322

To Activate:

- Touch the ENTER button or the UP or DOWN button to activate the screen.
- From the HOME SCREEN or Main Menu, scroll to Rotation/ Percussion/Vibration. Press ENTER.
- The Pulmonary Therapy Screen is now displayed.
- Scroll to Percussion, Vibration or Perc/Vib Therapy. Press ENTER. Select the desired therapy. Press ENTER.



ENTER to Start / Change

Percussion Settings

Position	CENTER
Turn	100 %
Frequency	3.5 BPS
Intensity	HIGH
Duration	1 min

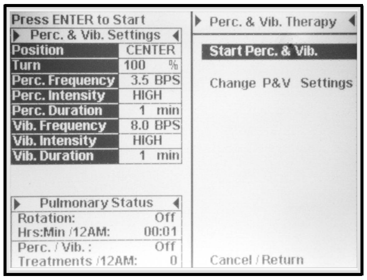
Pulmonary Status

Rotation:	Off
Hrs:Min /12AM:	00:01
Perc. / Vib. :	Off
Treatments /12AM:	0

Pulmonary Therapy
○ Rotation Therapy
○ Percussion Therapy
○ Vibration Therapy
○ Perc. & Vib. Therapy
○ Resume
● Normal / Standard
○ Max-inflate
○ Alarm Silence
○ Turn Assist
Change Alarm Settings
Statistics
GO TO Main Menu
GO TO Home Screen

m112c321

- Review therapy settings - if settings are acceptable, press Start Percussion, Vibration or Perc/Vib then press ENTER.
- Lower left corner Pulm Status shows: CLRT suspended and hr/minutes CLRT, and the number of percussion/vibration treatments since 12 am.



Press ENTER to Start

Perc. & Vib. Settings

Position	CENTER
Turn	100 %
Perc. Frequency	3.5 BPS
Perc. Intensity	HIGH
Perc. Duration	1 min
Vib. Frequency	8.0 BPS
Vib. Intensity	HIGH
Vib. Duration	1 min

Pulmonary Status

Rotation:	Off
Hrs:Min /12AM:	00:01
Perc. / Vib. :	Off
Treatments /12AM:	0

Perc. & Vib. Therapy
Start Perc. & Vib.
Change P&V Settings
Cancel / Return

m112c313

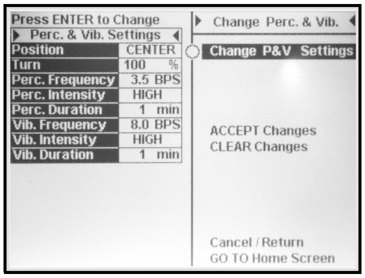
WARNING:
Under certain conditions, percussion and vibration therapy may produce noise levels reaching 67 dBa.

NOTE:
A treatment must be at least two minutes in duration to be captured as a treatment in the Statistic Summary.

The following settings can be changed:

- Position/Turn: Right/Left/Center or CLRT
- Percussion/Vibration: Right/left/Center CLRT position
- Percussion Beats/Sec: 1 - 5
- Intensity: Low-Med-High
- Duration: 1 - 30 minutes (Therapy must be more than 2 minutes to be captured in the statistics)
- Vibration Beats/Sec: 5 - 25

To Change Settings:

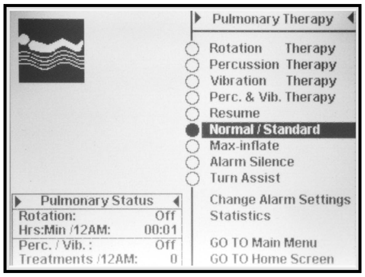


Position	CENTER
Turn	100 %
Perc. Frequency	3.5 BPS
Perc. Intensity	HIGH
Perc. Duration	1 min
Vib. Frequency	8.0 BPS
Vib. Intensity	HIGH
Vib. Duration	1 min

m112c312

- Scroll to Percussion, Vibration or Perc/Vib. Press ENTER.
- Scroll to change settings. Press ENTER again. This confirms the desire to change the settings.
- The icon moves to Percussion, Vibration or Perc/Vib Settings on upper left screen. Use the Up/Down arrows to make setting changes. Press ENTER to advance to next setting.
- Continue making changes/scrolling, using Up/Down arrows and the ENTER key until all changes are made.
- When the icon moves to Accept Changes. Press ENTER if acceptable.
- If not acceptable, scroll to Clear Changes, Cancel/Return, press ENTER.
- If percussion/vibration therapy is not going to be used at the time of setting, scroll to ACCEPT Changes, press ENTER. release the Graphical Caregiver Interface (GCI)® Control or select GO TO Home Screen for other options.

To Stop Percussion and/or Vibration Therapy:


Pulmonary Therapy
○ Rotation Therapy
○ Percussion Therapy
○ Vibration Therapy
○ Perc. & Vib. Therapy
○ Resume
● Normal / Standard
○ Max-inflate
○ Alarm Silence
○ Turn Assist
Change Alarm Settings
Statistics
GO TO Main Menu
GO TO Home Screen

Pulmonary Status
Rotation: Off
Hrs:Min /12AM: 00:01
Perc. / Vib.: Off
Treatments /12AM: 0

m112c317

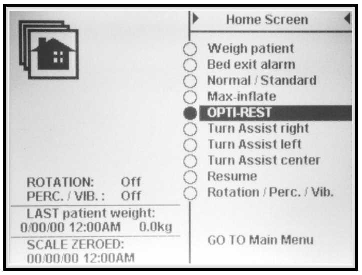
- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or the UP or DOWN button to activate the screen.
- From the Home Screen, Main Menu, or Rotation/ Perc./Vib screen, scroll to Rotation or Normal/Standard. Press ENTER.
- On the siderail opposite the Graphical Caregiver Interface (GCI)® Control, press the ENABLE control, and then the Normal/Standard control.

OPTI-REST Mode

The Opti-Rest mode offers increased comfort to the patient while maintaining pressure relief. It alternately vents the upper, seat/thigh, and foot zones producing a massaging action.

To Activate:

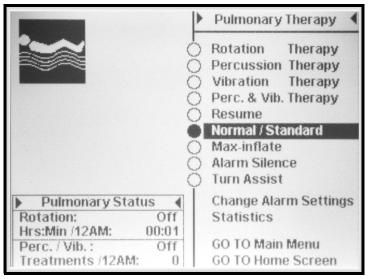
- From the Home screen, scroll to Opti-Rest. Press ENTER.


Home Screen
○ Weigh patient
○ Bed exit alarm
○ Normal / Standard
○ Max-inflate
● OPTI-REST
○ Turn Assist right
○ Turn Assist left
○ Turn Assist center
○ Resume
○ Rotation / Perc. / Vib.
GO TO Main Menu

ROTATION: Off
PERC. / VIB.: Off
LAST patient weight:
0/00/00 12:00AM 0.0kg
SCALE ZEROED:
00/00/00 12:00AM

m112c318

To Stop Opti-Rest Mode:


Pulmonary Therapy
○ Rotation Therapy
○ Percussion Therapy
○ Vibration Therapy
○ Perc. & Vib. Therapy
○ Resume
● Normal / Standard
○ Max-inflate
○ Alarm Silence
○ Turn Assist
Change Alarm Settings
Statistics
GO TO Main Menu
GO TO Home Screen

Pulmonary Status
Rotation: Off
Hrs:Min /12AM: 00:01
Perc. / Vib.: Off
Treatments /12AM: 0

m112c317

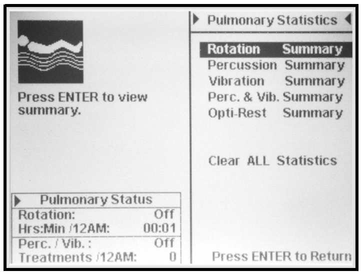
- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or the UP or DOWN button to activate the screen.
- From the Home Screen, Main Menu, or Rotation/ Perc./Vib screen, scroll to Normal/Standard. Press ENTER.
- On the siderail opposite the Graphical Caregiver Interface (GCI)® Control, press the ENABLE control and Normal/Standard control.

Therapy Statistics

To access the therapy statistics, scroll to the Statistics on the Pulmonary Therapy screen. Press ENTER.

Therapy Statistics for all therapy modes can be located from the Pulmonary Menu. Select desired therapy statistic, press ENTER. All readings will be documented at 12 am for each 24-hour period.

Rotation Summary: Displays the maximum number of cycles/hour the patient has rotated and Hrs: Mins in rotation, in 24 hours. For Positive Pulmonary Outcomes, rotate the patient at least 18 hours per day and as frequently per hour as patient will tolerate.


Pulmonary Statistics
Rotation Summary
Percussion Summary
Vibration Summary
Perc. & Vib. Summary
Opti-Rest Summary
Clear ALL Statistics
Pulmonary Status

Press ENTER to view summary.

Rotation: Off
Hrs:Min /12AM: 00:01
Perc. / Vib. : Off
Treatments /12AM: 0

Press ENTER to Return

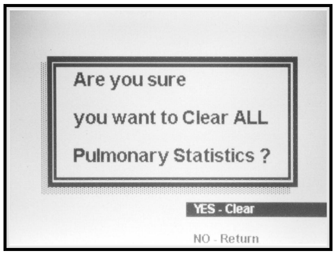
m112c319

Percussion and Vibration Summaries: Displays the number of treatments provided per 24-hour period. Duration of therapy must be at least 2 minutes to be counted as a treatment.

Opti-Rest Summary: Time spent in Opti-Rest mode since 12 am.

To Clear ALL Statistics:

- Scroll to Clear ALL Statistics, Press Enter. All statistics will be cleared.



Are you sure you want to Clear ALL Pulmonary Statistics ?

YES - Clear
NO - Return

m112c320

Turn Assist

The turn assist mode assists the caregiver in turning the patient for linen changes, dressing changes, bedpanning, backcare, or other nursing procedures.

To Activate:

- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or the UP or DOWN button to activate the screen.
- From the Home Screen or Main Menu, scroll to Turn Assist right, Turn Assist left, or Turn Assist center. Press ENTER.
- Press the Enable Control.
- On the siderail opposite the Graphical Caregiver Interface (GCI)® Control, press the ENABLE control and the desired Turn Assist setting.

To Deactivate:

- On the Graphical Caregiver Interface (GCI)® Control in the siderail, touch the ENTER button or the UP or DOWN button to activate the screen.
- From the Home Screen or Main Menu, scroll to Resume. Press ENTER.
- On the siderail opposite the Graphical Caregiver Interface (GCI)® Control, press the ENABLE control and the Resume control.

Additional Siderail Surface Controls

The following controls are available on the siderail opposite the Graphical Caregiver Interface (GCI)® control:

To Activate:

Press the Enable Control in the siderail to enable the desired features:

- **Max-Inflate** for easier patient repositioning. To discontinue Max-Inflate, press Resume to return to previous therapy mode (Rotation, Percussion or Vibration, Opti-rest, or Normal/Standard).
- **Resume** to return to prior therapy (Rotation, Percussion or Vibration or Normal/Standard). If a pulmonary therapy was suspended, Resume must be pressed before Normal/Standard can be activated.
- **Normal** to place the patient on a pressure relief surface, without rotation/percussion/vibration.
- **Turn Assist** for easier patient repositioning (i.e.,: for back care, linen changes, wound/dressing care).

Siderail indicates:

- Rotation/Percussion/Vibration Therapy is on.
- Rotation/Percussion/Vibration Therapy is Suspended
- Rotation Module and/or Percussion/Vibration Modules are Installed

Fluoroscopy Option

The fluoroscopy option provides a radiolucent head section that measures 22" (56 cm) square.

The radiolucent head section allows a caregiver to perform fluoroscopy of patients from head to waist when the patient is lying flat. Fluoroscopy of the patient's head and chest cavity is possible when the head section angle is at 75°.

Permanent IV Rods Option

The Permanent IV Rods option consists of two IV Rods that support up to two IV pumps plus bags. The IV Rods are attached to the frame near the corners of the headboard. Each pole can support up to 40 lb (18 kg).

⚠ **WARNING:**
Do not exceed IV rod weight capacity. Doing so could result in personal injury or equipment damage.

⚠ **CAUTION:**
Do not mount infusion pumps on the lower section of an IV Rod. Interference with head section articulation could result.

To Deploy:

1. Lift the IV Rod from its stored position behind the headboard.
2. Make sure that the pole drops and locks into position.
3. Raise the upper section of the pole until it locks into position. The pole is ready for use.

To Store:

1. Grasp and hold the upper section of the pole. Push the upper collar down, and lower the upper pole section.

2. Lift the lower section of the pole up, and rotate the pole down to the stored position between the transport handles and the headboard. The poles should rest in the storage slots provided on the frame.

Optional 5" Twin Wheel Casters

These casters are a dual-wheel design, providing a smooth rolling action.

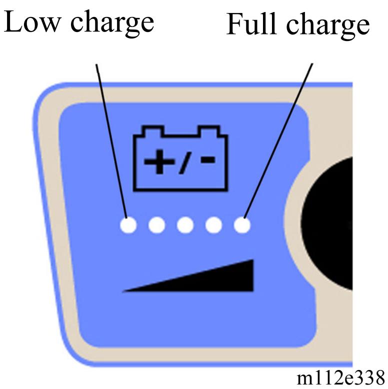
Optional 6" Casters

These casters are a single-wheel design providing a smooth rolling action. They provide a 1.615" (4.102 cm) increase in bed height/under bed clearance than units equipped with the standard 5" caster.

IntelliDrive® Transport System

To prepare the bed for transport:

- Raise all four siderails to the up and locked position.
- Adjust the bed position to ensure an unobstructed view from the head end of the bed.
- Secure all equipment being transported with the bed (monitors, oxygen tanks, IV poles, etc.).
- Ensure the transport handles are in the up and locked position.

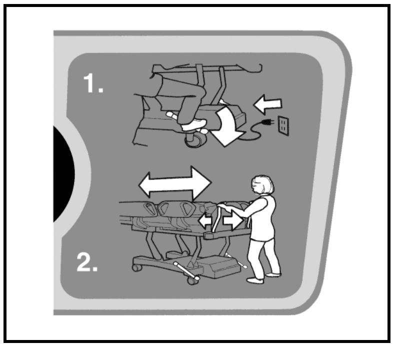


m112e338

To activate the transport system for transport:

- Unplug the bed from its power source.
- Set the brake and steer system to *steer*.

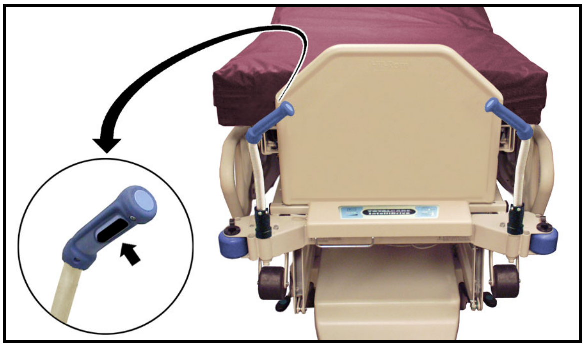
NOTE:
Unplugging the bed, and putting the bed in steer mode will automatically lower the drive wheel, but will **not** power the transport system.



m112d343

To power the transport system:

- Grip one or both of the transport handles located at the head end of the bed.
- Depress at least one of the enable switches on the inside of the transport handles.



m112d339

    - Depressing an enable switch engages the drive wheel on the bed so it can move when pressure is applied to the handles.
    - Depressing an enable switch will not cause the bed to start moving if there is no pressure applied to the handles.
- Push the transport handles toward the bed to start forward movement or pull them toward you to start reverse movement.
    - Pressure sensors located in the transport handles sense the applied pressure and activate the motor and propel the bed in the direction of applied pressure.
    - The amount of applied pressure to the handles will regulate the speed of the bed.
        - The more forward applied pressure, the faster the bed will move forward. Maximum forward speed is between 2.5 and 3.5 mph on level flooring.
        - The more reverse applied pressure, the faster the bed will move in reverse. Maximum reverse speed is between 1.0 and 2.0 mph on level flooring.
- Decreasing pressure on the transport handles will slow the bed down.
- Releasing the enable switch(es) on the transport handles will cause the bed to stop.

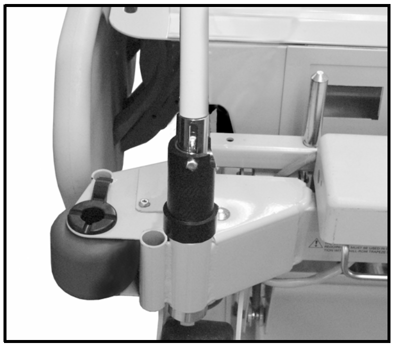
To remove power from the transport system:

- Remove your hands from the switches on the transport handles, or
- Set the brake/steer system to neutral or brake, or
- Plug the bed into an appropriate power source.

WARNING:
Always set the brake when the bed and/or patient is not being transported. Failure to do so could result in the moving under its own power. Personal injury or equipment damage could occur.

To store the transport handles:

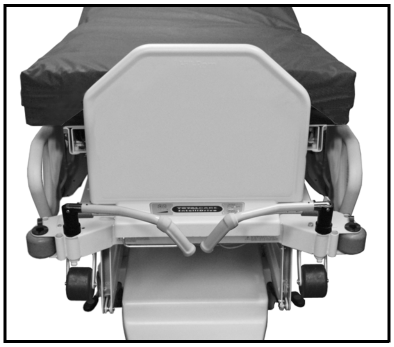
- Grasp the handles and lift upwards to unlock the handles.
- Swing the handles inward toward the center of the bed, into the stowed position.



m112d340

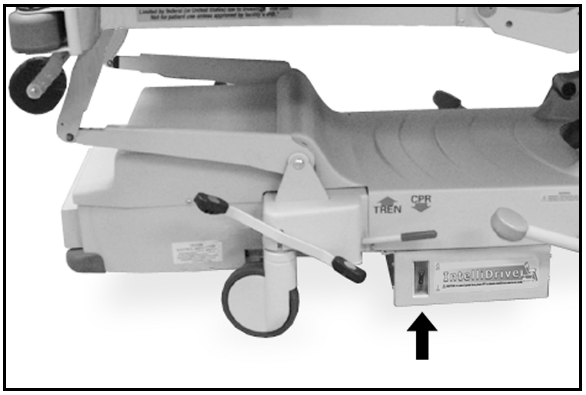
Emergency Use:

In case of an emergency, press the electronic brake switch to off to permit forward and reverse bed movement with a deployed, unpowered, transport system.



m112d341

WARNING:
If the bed propels forward or reverse when depressing one of the enable switches and not applying any pressure on either of the handles, contact your local service personnel for repair. Failure to do so could result in personal injury or equipment damage.



m112d342

WARNING:
When using freestanding patient-attached equipment or traveling through doorways, significantly reduce the travel speed of the IntelliDrive® Transport System. Failure to do so could result in personal injury or equipment damage.

CAUTION:
The IntelliDrive® Transport System is intended for indoor use only. Outdoor use may cause temporary or permanent damage to the powered drive mechanism and/or drive belt.

Accessory AC Receptacle Option (120V Only)

The accessory receptacle option is a convenient source of AC power for accessory devices. It is located at the foot end of the base frame. When AC power is present at the receptacle, the indicator light on the receptacle illuminates.

The accessory receptacle has a surge suppression feature. If the receptacle indicator light does not illuminate or a continuous beep sounds while the receptacle power cord is plugged in, the accessory receptacle is no longer providing electrical surge protection. Replace the receptacle to restore surge protection.

The accessory receptacle provides up to 12 amps of AC current. TotalCare® Bed Systems that have this option are equipped with two power cords, one for the accessory receptacle and one for the TotalCare® Bed System. The receptacle is isolated from the bed system’s AC supply voltage power cord.

WARNING:
Plug the two power cords into different receptacles on **separate** circuits. Failure to do so could result in power loss to patient equipment.

The accessory outlet is not intended for life support equipment.

Fracture Frame Adapter Brackets

The fracture frame adapter brackets allow the use of a fracture frame (Buck’s traction and cervical traction).

Devices

Buck’s Traction Device

WARNING:
A **full overhead** fracture frame **cannot** be used with the TotalCare® Bed System without the use of the fracture frame adapter brackets. Use of a full overhead frame without of the fracture frame adapter brackets could result in personal injury or equipment damage.

WARNING:
Only use **Head Up/Down**, **Bed Up/Down**, or **Trendelenburg** articulation controls. Using other articulation controls could result in personal injury or equipment damage.

To Use:

- Install Buck’s traction device to the foot end of the system.
- Simultaneously press the **Enable key** control and the Knee Lockout control to lock out the **patient** knee **Up/Down** controls.
- Use approved system articulation controls for application with the traction device:
  - Press the Head **Up/Down** control to raise/lower the head section to the desired position.
  - Press the Bed **Up/Down** control to move the system up or down to the desired position.
  - Press the Trendelenburg and Reverse Trendelenburg control to articulate the system to the desired position.

Cervical Traction Device

WARNING:
A **full overhead** fracture frame **cannot** be used with the TotalCare® Bed System without the use of the fracture frame adapter brackets. Use of a full overhead frame without the fracture frame adapter brackets could result in personal injury or equipment damage.

WARNING:
Use Only **Bed Up/Down** or **Trendelenburg** articulation controls. Using other articulation controls could result in personal injury or equipment damage.

To Use:

- Install the cervical traction device to the head end of the system.
- Simultaneously press the **Enable key** control and the Knee Lockout control to lock out the **patient** knee up/knee down controls.
- Simultaneously press the **Enable key** control and the Head Lockout control to lock out the **patient** head up/knee down controls.
- Use approved system articulation controls for application with the traction device:
  - Press the Bed **Up/Down** control to move the system up or down to the desired position.
  - Press the Trendelenburg/Reverse trendelenburg control to articulate the system to the desired position.

Specifications

Physical Description

For TotalCare® Bed System specifications, (see table 1-2 on page 1-75).

Table 1-2. TotalCare® Bed System Specifications

Feature	Dimension
Height—from floor to top of articulating deck (bottom of mattress) in low position	Between stepped sides, 14.5" to 15.5" (36.8 cm to 39.4 cm)
Height—from floor to top of articulating deck (bottom of mattress) in high position	Between stepped sides, 33.5" to 34.5" (85.9 cm to 87.6 cm)
Minimum under bed clearance	4.75" (12.07 cm) 4.25" (10.80 cm) ("B" model beds and newer) 1.25" (3.18 mm) (IntelliDrive® Transport System Beds)
Minimum clearance between articulating deck foot section and the floor for any bed position, except the tilt-table and the chair egress positions with the foot section at 90°	2.0" (5.1 cm)
Overall width—siderails raised Overall width—siderails lowered Overall width—distance between casters	40.5" (102.9 cm) 37" (94 cm) 25.5" (64.8 cm)
Overall length Overall length—roller bumpers installed Overall length—transport shelf installed	91.5" (232.4 cm) 92.5" (235.0 cm) 93.5" (237.5 cm)
Overall foot section width	28.88" to 29.13" (73.36 cm to 73.99 cm)
Fully extended length of the foot section from pivot to inside of the footboard	26.75" to 27.25" (67.95 cm to 69.22 cm)
Articulating deck length	81.75" to 82.25" (207.65 cm to 208.92 cm)
Maximum head elevation	75°
Maximum knee elevation	20°

Feature	Dimension
Maximum foot elevation	85° down
Maximum foot retract	12" (30 cm)
Maximum Trendelenburg	15°
Maximum Reverse Trendelenburg	15°
Maximum Emergency Trendelenburg	20°
Bed safe working load (patient and equipment)	500 lb (226 kg)
Bed weight with minimum options Bed weight with maximum options	525 lb (238 kg) 585 lb (265 kg)
Short stay surface weight	36 lb (16 kg)
Treatment surface weight	25 lb (11 kg)
Casters	5" (13 cm) diameter
Sleep surface length	83" (211 cm)— primary section 56" (142 cm), and foot section 27" (69 cm)
Sleep surface width	Primary section 35" (89 cm) and foot section 31" (79 cm)
Primary sleep surface thickness	9" (23 cm) at center, and 8" (20 cm) at edges (including step in the deck)
Sleep surface height	5" (13 cm)
Maximum scale weight	400 lb (181 kg)
Scale accuracy	1% of patient weight
Scale repeatability	±.3% 70.5 lb to 175 lb (32.0 kg to 79.4 Kg) ±.1% 176 lb to 400 lb (79.8 kg to 181.4 Kg)

Electrical Description

Accessory Receptacle (120V Model Only)

The maximum current available at the accessories receptacle is 12 A at 120V AC. TotalCare® Bed Systems that have the optional accessory receptacle are equipped with two power cords, one for the accessory receptacle and one for the TotalCare® Bed System. The receptacle is isolated from the bed system's AC supply voltage power cord.

The accessory receptacle has a surge suppression feature. If the receptacle indicator light does not illuminate or a continuous audible beep occurs while the receptacle power cord is plugged in, the accessory receptacle is no longer providing electrical surge protection. Replace the receptacle to restore surge protection.

Regulations, Standards, and Codes

UL, VDE Classification

Type of protection against electric shock = Class I

Degree of protection against electric shock = Type B

Degree of protection against harmful ingress of water = IPX0

Intermittent operation = 3 minutes on/30 minutes off (120V unit only)

Intermittent operation = 3 minutes on/45 minutes off (100V, 110V, 127V, 220V, 230V, and 240V units only)

WARNING:
Do not use the TotalCare® Bed System with oxygen tents. Damage to equipment or personal injury can occur.

Use oxygen administering equipment of the nasal, mask, or ventilator type only. Do not use with oxygen tents.

Model Identification

For TotalCare® Bed System model identification (see table 1-3 on page 1-78).

Table 1-3. Model Identification

Model Number	Description
P1900AA	TotalCare® Bed System without air and scale
P1900AB	TotalCare® Bed System without air, with scale
P1900AE	TotalCare® Bed System with air, without scale
P1900AF	TotalCare® Bed System with air and scale
P1900B	TotalCare® Bed System with extended height casters or integral casters
P1900C	TotalCare® Bed System with new hydraulic system
P1900D	TotalCare® Bed System with new software (and/or TotalCare SpO_2RT® Pulmonary Therapy System)
P1900E	TotalCare® Bed System with new base tub and optional IntelliDrive® Transport System
P1900F	TotalCare® Bed System with new style intermediate siderails and headboard
P1900G	TotalCare® Bed System with voltages, optional IntelliDrive® Transport System, and/or TotalCare SpO_2RT® Pulmonary Therapy System for Europe, Middle East, Asia, and Latin America

Safety Tips

Bed Positions

Always leave the bed system in the **low** position when a patient is unattended.

Siderails

Siderails are not intended to be used as restraint devices. Medical personnel should determine the appropriate use of siderails to ensure patient safety.

Observe tubes and cables closely during articulations. Always use good lines placement techniques, particularly as the head section rises.

Brakes

Always set the brakes when the bed system is occupied. Push and pull the bed system sideways to ensure that the brakes have engaged.

Brakes must be set during chair mode, patient egress, ingress, transfers, and when the system is occupied (except during transport). Brakes should be periodically tested when the bed system is left unoccupied.

Fluids

Significant fluid spills onto the system electronics can result in a hazard. If such a spill occurs, the system should be unplugged, removed from service, thoroughly cleaned, allowed to completely dry, and checked by service personnel.

1. Unplug the system from its power source.
2. Take care of the patient.
3. Clean the fluid spill from the system.
4. Have maintenance inspect the system completely.
5. Do not put the system back into service until it is thoroughly dry, tested, and determined safe to operate.

Electrical Safety

Do not plug the system power cord and accessory power cords into the same duplex receptacle. To prevent overloading one supply circuit, plug the power cords into receptacles on separate circuits.

SHOCK HAZARD:
Take care to prevent damage to AC power cords. An electrical shock hazard could exist. When a system is being cleaned it should be unplugged from its power source.

Establish policies and procedures to train and educate your staff on the risks associated with electrical equipment.

Lockout Controls (Hilow, Head, Knee, Master)

To restrict a patient or visitor from operating the applicable patient controls, activate the lockout controls on the Point-of-Care® Siderail Controls.

Parts and Accessories

Use only Hill-Rom parts and accessories. Do not modify the bed system without authorization from Hill-Rom.

Operating Bed/Surface Precautions

Do not use the electric system/surface configuration in the presence of flammable gas or vapors.

WARNING:
Do not use the TotalCare® Bed System with oxygen tents. Damage to equipment or personal injury can occur.

Use oxygen administering equipment of the nasal, mask, or ventilator type only. The TotalCare® Bed System is not to be used with oxygen tents.

Transport Mode

The TotalCare® Bed System is intended to be used to transport patients with the foot end of the system forward. Prior to transport, disconnect and properly store the power cords and Nurse Call system cables, where provided, to prevent tripping.

SHOCK HAZARD:
Take care to prevent damage to AC power cords. An electrical shock hazard exists.

Use only transport handles or footboard to move the bed during transport.

Make sure that the patient, equipment, and all lines are securely placed within the perimeter of the system. The TotalCare® Bed System is not intended to be used to transport a patient in the recline chair, chair, or chair egress modes.

If equipped with the transport shelf/charting table, secure all of the equipment with the straps provided and observe the 45 lb (20 kg) weight limit. Keep the transport shelf/charting table accessory horizontal during patient transport. This requires that the foot section be in the horizontal position during patient transport.

Fully extended IV Rods could impact doorways or ceiling fixtures. Lower poles prior to patient transport.

Ensure nurse call system cables are properly connected after transport.

CAUTION:
Although a fully-charged battery is preferred, transport may be done when the battery charge is low. The bed should be reconnected to AC power to charge as soon as possible.

Sleep Surface/Mattress

Do not use mattresses, mattress overlays, mattress replacements, or speciality mattress products that have **not** been designed by Hill-Rom for the TotalCare® Bed System. Use of surface products other than those designed for the TotalCare® Bed System could substantially reduce the effectiveness of the safety features incorporated into the system.

WARNING:
Sleep surface impermeability *will be degraded* when needle sticks or other puncture damage occurs to the sleep surface. Use x-ray cassette covers to avoid damaging the sleep surface ticking.

Regularly inspect the sleep surface for x-ray cassette damage or needle punctures.

Patient weight and equipment is not too exceed 500 lb (227 kg) maximum, and 70 lb (32 kg) minimum. The weight includes mattress, IV pumps, poles, and bags. The scale accuracy may be diminished if patient weight exceeds 400 lb (181 kg). Mattress interface pressure performance may be diminished if patient weight exceeds 300 lb (136 kg).

Flammability

Reduce the possibility of fires by observing fire prevention rules and regulations.

The sleep surface foam meets applicable requirements of California Technical Bulletin 117—*Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture*.

The sleep surface meets the following domestic codes and standards:

- Code of Federal Regulations No. 16, Part 1632—*Standard for the Flammability of Mattresses and Mattress Pads.*
- California Technical Bulletin 129—*Flammability Test Procedure for Mattresses for Use in Public Buildings.*
- Boston Fire Department, IX-11—*Mattress Fire Test.*
- National Fire Protection Association (NFPA®[1]) 101: 1997 (and subsequent issue)—*Life Safety Code.*

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[1] NFPA® is a registered trademark of National Fire Protection Association, Inc.

For applicable flammability standards for European mattresses, refer to table 1-4 on page 1-83.

Table 1-4. European Mattress Flammability Standards

Model Number	Flammability Standard(s)
P1915EA24/25	Meets Italian standards: • UNI EN597-1: 1997—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 1. Ignition Source: Smouldering Cigarette.* • UNI EN597-2: 1997—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 2. Ignition Source: Match Flame Equivalent.* • UNI 9175: 1987/A1:1994—*Reaction to Fire of Upholstered Furniture Subjected to the Action of a Small Flame.*
P1915EA26/27/28	Meets United Kingdom standards: • BS EN597-1: 1995—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 1. Ignition Source: Smouldering Cigarette.* • BS EN-597-2: 1995—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 2. Ignition Source: Match Flame Equivalent.* • BS 7177: 1996—*Medium Hazard—Specification for Resistance to Ignition of Mattresses, Divans, and Bed Bases.* • BS-6807: 1996, Section 2—*Source 5. Top and Bottom—Methods for Assessment of the Ignitability of Mattresses and Upholstered Divans and Upholstered Bed Bases with Flaming Types of Primary and Secondary Sources of Ignition.*

Model Number	Flammability Standard(s)
P1915EA20	Meets French standards: • NF EN 597-1: 1995—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 1. Ignition Source: Smouldering Cigarette.* • NF EN 597-2: 1995—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 2. Ignition Source: Match Flame Equivalent.* • GPEM/CP D1 bis 89—*Smouldering Cigarette Test (test a la cigarette).* • GPEM/CP D1-90—*Response to Fire of Mattresses Used in High Risk Premises, No. 5590, 1991, Open Flame Test.*
P1915	Meets European standards: • CEN EN 597-1: 1994—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 1. Ignition Source: Smouldering Cigarette.* • CEN EN 597-2: 1994—*Furniture—Assessment of the Ignitability of Mattresses and Upholstered Bed Bases, Part 2. Ignition Source: Match Flame Equivalent.*

Bed Articulations

Do not operate system controls until all equipment and persons are clear of mechanisms.

To stop a function:

- release the control
- and/or activate the opposite function
- and/or immediately unplug the power cord.

Observe tubes and cables closely during articulations. Always use good line management techniques, particularly as the head section rises.

Chair Positioning

Always set the brakes before placing the system in a chair position. Observe lines closely during head up/down and chair articulations.

NOTE:
Make sure the foot end casters are rotated toward the head end of the bed.

Visitor Notification

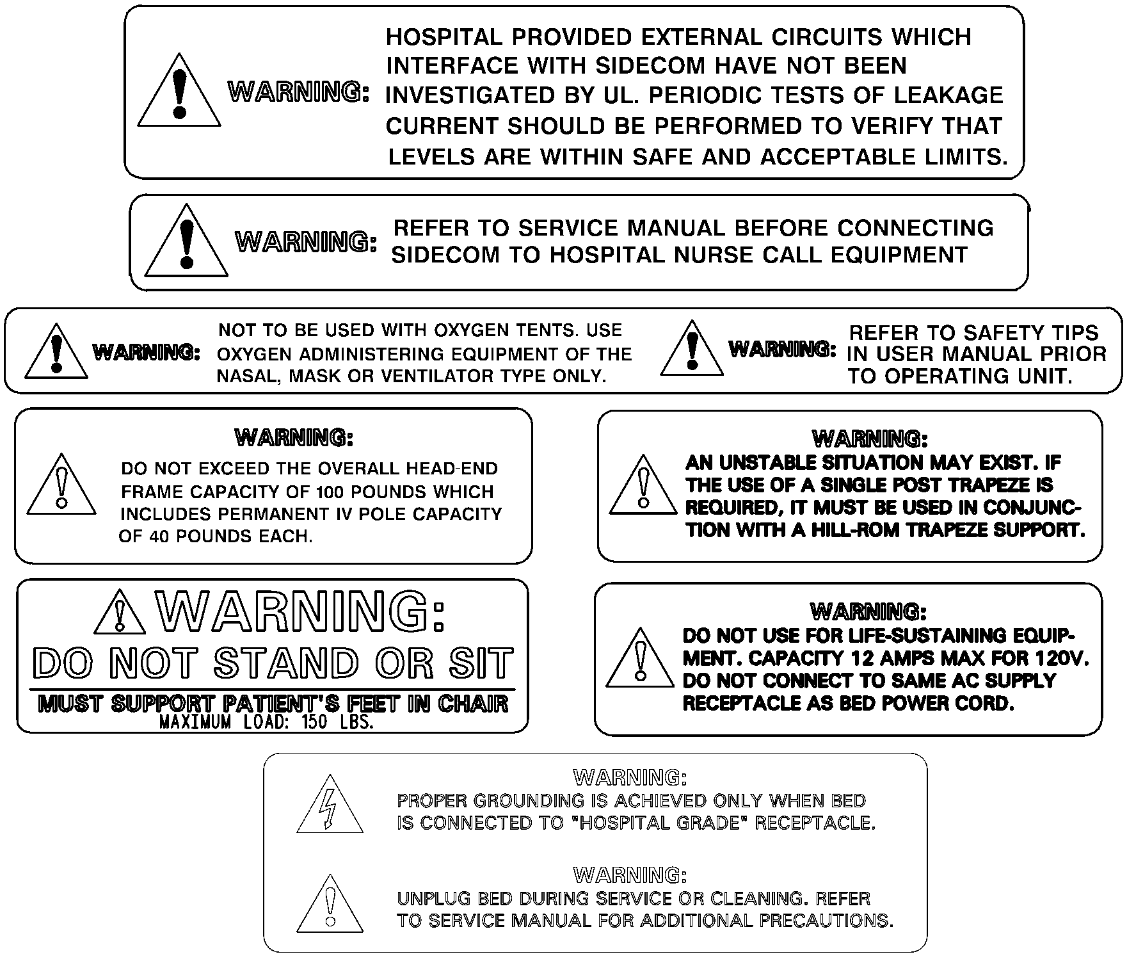
Instruct patient visitors not to attempt operation of caregiver controls. They may assist the patient with patient controls.

Preventive Maintenance

Perform preventive maintenance to ensure all TotalCare® Bed System components are functioning as originally designed. See “Preventive Maintenance Schedule” on page 6-36.

Warning and Caution Labels

Figure 1-47. Warning and Caution Labels



WARNING: HOSPITAL PROVIDED EXTERNAL CIRCUITS WHICH INTERFACE WITH SIDECOM HAVE NOT BEEN INVESTIGATED BY UL. PERIODIC TESTS OF LEAKAGE CURRENT SHOULD BE PERFORMED TO VERIFY THAT LEVELS ARE WITHIN SAFE AND ACCEPTABLE LIMITS.

WARNING: REFER TO SERVICE MANUAL BEFORE CONNECTING SIDECOM TO HOSPITAL NURSE CALL EQUIPMENT

WARNING: NOT TO BE USED WITH OXYGEN TENTS. USE OXYGEN ADMINISTERING EQUIPMENT OF THE NASAL, MASK OR VENTILATOR TYPE ONLY.

WARNING: REFER TO SAFETY TIPS IN USER MANUAL PRIOR TO OPERATING UNIT.

WARNING:
DO NOT EXCEED THE OVERALL HEAD END FRAME CAPACITY OF 100 POUNDS WHICH INCLUDES PERMANENT IV POLE CAPACITY OF 40 POUNDS EACH.

WARNING:
AN UNSTABLE SITUATION MAY EXIST. IF THE USE OF A SINGLE POST TRAPEZE IS REQUIRED, IT MUST BE USED IN CONJUNCTION WITH A HILL-ROM TRAPEZE SUPPORT.

WARNING:
DO NOT STAND OR SIT
MUST SUPPORT PATIENT'S FEET IN CHAIR
MAXIMUM LOAD: 150 LBS.

WARNING:
DO NOT USE FOR LIFE-SUSTAINING EQUIPMENT. CAPACITY 12 AMPS MAX FOR 120V. DO NOT CONNECT TO SAME AC SUPPLY RECEPTACLE AS BED POWER CORD.

WARNING:
PROPER GROUNDING IS ACHIEVED ONLY WHEN BED IS CONNECTED TO "HOSPITAL GRADE" RECEPTACLE.

WARNING:
UNPLUG BED DURING SERVICE OR CLEANING. REFER TO SERVICE MANUAL FOR ADDITIONAL PRECAUTIONS.

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Chapter 2
Troubleshooting Procedures

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Getting Started

WARNING:
Only facility-authorized personnel should service the TotalCare® Bed System. Servicing by unauthorized personnel could result in personal injury or equipment damage.

Begin each procedure in this chapter with step 1. Follow the sequence outlined (each step assumes the previous step has been completed). In each step the normal operation of the product can be confirmed by answering **Yes** or **No** to the statement. Your response will lead to another step in the procedure, a repair analysis procedure (RAP), or a component replacement. If more than one component is listed, replace them in the given order.

To begin gathering information about the problem, start with the **Initial Actions**. To isolate or identify a problem and to verify the repair after completing each corrective action (replacing or adjusting a part, seating a connector, etc.) perform the **Function Checks**. The TotalCare® Bed System employs a built-in, fault analysis feature. Faults are displayed through the **Service required** indicator and/or the Graphical Caregiver Interface (GCI)® Control, if equipped. The **Service required** indicator lamp, located on both intermediate siderail caregiver control panels, flashes to indicate a system malfunction.

The **Service required** indicator, when activated, displays the detected failure as a network fault message coded into three groups of flashes:

- The first flash group identifies the module number affected, followed by a 1 second delay.
- The second group of flashes indicates the most significant number of the numerical fault code followed by another 1 second delay.
- The third group of flashes identifies the least significant number of the numerical fault code.

NOTE:
A 1 second delay separates each group.

To access the fault code information, simultaneously press the **Head** and **Knee Lockout** control located on the head siderail. To determine the fault code number, count the number of flashes in each group. After a 3 second delay, the completed fault code repeats once for each activation.

If multiple failures occur, the indicator may flash more than one fault code (see table 2-3 on page 2-22)). A 60 second delay is required between consecutive activations of the fault codes.

If the Graphical Caregiver Interface (GCI)® Control option is installed, the diagnostic Graphical Caregiver Interface (GCI)® Control screens can be queried for system status information. To access the Graphical Caregiver Interface (GCI)® Control Code screens, press and hold the **UP** and **DOWN** arrow for 15 seconds. When selected, the diagnostic menu shows fault messages listed in numerical sequence and by fault code name. Corrective actions are provided within this chapter.

After verifying repairs with functional checks, perform **Final Actions.**

If the troubleshooting procedures do not isolate the problem, call Hill-Rom Technical Support at (800) 445-3720 for technical assistance.

Initial Actions

To gather information from operators concerning problems with the TotalCare® Bed System, use Initial Actions. Note symptoms or other information concerning the problem that the operator describes. This information helps identify the probable cause.

1. Someone who can explain the problem is available.

   Yes **No**
   ↓ → Go to "Function Checks" on page 2-10.

2. Ask that person to demonstrate or explain the problem. The problem can be duplicated.

   Yes **No**
   ↓ → Go to "Function Checks" on page 2-10.

3. The problem is a result of improper operator action.

   Yes **No**
   ↓ → Refer to table 2-1 on page 2-8, or go to "Function Checks" on page 2-10.

4. Instruct the operator to refer to the procedures in the *TotalCare® Bed System User Manual*. To ensure proper operation of the TotalCare® Bed System, perform "Function Checks" on page 2-10.

Quick Reference Problem/Solution Matrix

The following table is provided to quickly direct the technician to an applicable troubleshooting procedure if a problem with the bed system is readily identified.

Table 2-1. Quick Reference Problem/Solution Matrix

Problem	Solution
Patient air surface module with foot therapy—switch/stepper failures	RAP 2.1
Patient air surface module with foot therapy—pressure failures	RAP 2.2
Patient air surface module with foot therapy—blower/supply hose failures	RAP 2.4
Air blower malfunction	RAP 2.5
System power failures	RAP 2.6

Problem	Solution
Enable (key) control malfunction	RAP 2.7
Lockout control malfunction	RAP 2.8
Brake/steer malfunction	RAP 2.9
Indicators (LED) do not illuminate	RAP 2.10
Bed down control does not lower bed	RAP 2.11
Bed up control does not raise bed	RAP 2.12
Chair position control malfunction	RAP 2.13
Bed flat control does not flatten bed	RAP 2.14
Caregiver control malfunction on head siderail and intermediate siderail	RAP 2.15
Reverse Trendelenburg/Trendelenburg control malfunction	RAP 2.16
Patient controls malfunction	RAP 2.18
CPR release malfunction	RAP 2.19
Emergency Trendelenburg malfunction	RAP 2.20
Trendelenburg/Reverse Trendelenburg malfunction	RAP 2.21
Hydraulic foot pump pedal does not raise bed	RAP 2.22
Siderail mechanism does not hold	RAP 2.23
SideCom® Communication System/Nurse Call malfunction	RAP 2.24
Bed Exit malfunction	RAP 2.25
Patient Exit/Priority Nurse Call malfunction	RAP 2.26
Night light does not illuminate	RAP 2.27
Patient entertainment malfunction	RAP 2.28
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Scale/Graphical Caregiver Interface (GCI)® Control malfunction	RAP 2.30
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Problem	Solution
Scale/Graphical Caregiver Interface (GCI)® Control—calibration error troubleshooting	RAP 2.33
Load beam—shorted excitation voltage	RAP 2.34
Hydraulic system malfunction	RAP 2.35
Hydraulic fluid leak	RAP 2.36
Maximum inflate malfunction	RAP 2.37
Treatment surface air bladders malfunction	RAP 2.38
Loss of therapy during transport	RAP 2.39
LON communication fault	RAP 2.40
Air manifold malfunction	RAP 2.41

Function Checks

Function checks determine whether the TotalCare® Bed System is operating properly. In the event of a malfunction, refer to the Graphical Caregiver Interface (GCI)® Control, if equipped. Otherwise, refer to the siderail **Service required** indicator lamp, and decode the flashes according to the fault codes detailed in “Fault Codes” on page 2-19.

Most caregiver control panel functions are available from both the right and left siderails. When checking redundant function controls, activate each of the siderails to determine if the fault is contained in one or both of the siderails. If the **Service required** indicator flashes at any time during this procedure, go to the fault code list and perform the corrective action (see table 2-3 on page 2-22)).

1. Initial actions have been performed.

   Yes **No**
   ↓ → Go to “Initial Actions” on page 2-8.

2. Perform the following:
   a. Set the brake.
   b. Plug the left power cord into an appropriate power source.
   c. Inspect for obvious problems, such as loose connections or damaged components.

d. Articulate the patient surface to the flat position.

The **Service required** indicator on the caregiver control panel is on (not flashing).

Yes No
↓ → Go to step 6.

3. Obtain fault codes by one of the following methods:
   - To read the fault message codes, simultaneously press the **Knee Lockout** control and **Head Lockout** control to flash fault codes on the flashing **Service required** indicator.
   - If a Graphical Caregiver Interface (GCI)® Control is installed, select the Service Menu on the Graphical Caregiver Interface (GCI)® Control screen by pressing and holding the **Up/Down** arrow controls until the service menu appears (15 seconds).

   Fault codes are identified.

   Yes No
   ↓ → Go to table 2-3 on page 2-22.

4. Press the **Enable key** control on each intermediate siderail. The **Enable key** indicator (lamp) comes on.

   Yes No
   ↓ → Go to RAP 2.7.

5. Check the **Master Lockout** control function on the intermediate siderail: When the **Master Lockout** control is toggled from off to on, the bed alarm double beeps, and the **Master Lockout** control indicator comes on.

   Yes No
   ↓ → Go to RAP 2.8.

6. Unplug the left power cord from its power source. The **Unplugged AC** indicator comes on.

   Yes No
   ↓ → Charge the battery, if present (required by nurse call, manual, and treatment surface options).

7. Take the following steps:
   a. Plug the left power cord into an appropriate power source.
   b. Ensure all **lockouts** are disabled.
   c. Press the **Bed Flat** control. The bed system moves to a flat level position.

Yes **No**
↓ → Go to RAP 2.14.

8. With the bed system in the mid-hilow position, flat, and the foot section fully extended, press the individual section articulation controls (i.e.; **Head Up, Head Down, Knee Up, Knee Down, Foot Up, Foot Down, Foot In, Foot Out, Bed Up, Bed Down**, **Trendelenburg and Reverse Trendelenburg).** The respective section moves.

Yes **No**
↓ → Operate the bed system from the opposite siderail.

9. The opposite siderail functions properly.

Yes **No**
↓ → Go to RAP 2.15.

10. With the footboard installed and the bed system midway in the hilow position, press and hold the **Chair** control. The bed system articulates from bed to recliner to chair position and beeps in the chair position.

Yes **No**
↓ → Go to RAP 2.13.

11. Remove the footboard. Press and hold the **Chair** control. The foot section continues downward to an 85° position.

Yes **No**
↓ → Go to RAP 2.7.

12. Using the **Bed Flat** control, articulate the bed system from the chair egress to the recliner, to the flat position. After an audible beep, the system successfully moves from the chair egress to the recliner, pauses, and then moves to the flat position.

Yes **No**
↓ → Go to RAP 2.14.

13. With the bed system in the flat position, use the **patient** controls to raise the head section to the up position. The head and the knee sections automatically contour to a 50° head angle and 10° knee angle and do not drift down. (**Note:** 10° is midway through the knee range).

Yes **No**
↓ → Go to RAP 2.18.

14. Using the **patient** control, lower the head section to the flat position. The head and the knee sections move to the flat position.

Yes **No**
↓ → Go to RAP 2.18.

15. Using the **patient** control, raise the knee section to the up position. The knee section moves to the maximum up position, remains in the up position, and does not drift down.

    Yes **No**
    ↓ → Go to RAP 2.18.

16. Using the **patient** control, lower the knee section to the flat position. The knee section moves to the flat position.

    Yes **No**
    ↓ → Go to RAP 2.18.

17. Place the bed system in chair egress position. Press down on the foot CPR/Trendelenburg release pedal. The bed system flattens to the CPR position.

    Yes **No**
    ↓ → Go to RAP 2.19.

18. Use the foot controls to activate the Emergency Trendelenburg feature. The head end moves below the foot end.

    Yes **No**
    ↓ → Go to RAP 2.20.

19. Remove the AC power. Wait 45 seconds if a treatment surface is present; then depress the hilow **Bed Up** control, and pump the foot pump pedal. The bed system moves to the maximum high position, remains in the high position, and does not drift down.

    Yes **No**
    ↓ → Go to RAP 2.22.

20. Raise all of the siderails to the up position. All of the siderails lock in the up position.

    Yes **No**
    ↓ → Go to RAP 2.23.

21. Press the caregiver and patient **nurse call** controls. All nurse call features are operational.

    Yes **No**
    ↓ → Go to RAP 2.24.

22. Activate the **Bed Exit** feature and **Bed Exit** alarm. The **Bed Exit** feature and alarm are operational.

    Yes **No**
    ↓ → Go to RAP 2.25.

The **Bed Exit** indicator on the caregiver control panel is **on**.

Yes **No**
↓ → Go to RAP 2.25.

23. Deactivate the **Bed Exit** feature. The **Bed Exit** indicator on the caregiver control panel is **off**.

    Yes **No**
    ↓ → Go to RAP 2.26.

24. Cover the photocell. The night light is operational.

    Yes **No**
    ↓ → Go to RAP 2.27.

25. Activate the patient entertainment controls. The entertainment features are operational.

    Yes **No**
    ↓ → Go to RAP 2.28.

26. Activate the patient light features. The light features are operational.

    Yes **No**
    ↓ → Go to RAP 2.29.

27. Scroll the Graphical Caregiver Interface (GCI)® Control screen up and down, if equipped. Move through the various screens. The Graphical Caregiver Interface (GCI)® Control is functioning properly.

    Yes **No**
    ↓ → Go to RAP 2.28.

Treatment Surface Diagnostics

If the **Service required** indicator flashes at any time during this procedure, go to the fault code table, and perform the corrective action (see table 2-3 on page 2-22).

1. Initial actions have been performed.

   Yes **No**
   ↓ → Go to “Initial Actions” on page 2-8.

2. Unplug the left power cord from its power source. The **Unplugged AC** indicator is on.

   Yes **No**
   ↓ → Go to RAP 2.5.

3. Perform the following:
   a. Set the brakes.
   b. Inspect for obvious problems such as loose connections or damaged components.
   c. Plug the left power cord into an appropriate power source.
   d. Ensure all air hoses are properly routed and that they are not kinked.

4. Articulate the patient surface to the flat position. The three zones are inflated: head, thigh, and seat.

   Yes **No**
   ↓ → Make sure all hose connections between the manifold and the hoses from the mattress are locked. Check for kinked hoses.

5. Squeeze and hold pressure on the head section. The head section deflates slightly within 30 seconds.

   Yes **No**
   ↓ → Replace the control module, actuator, valve, or pressure sensor in the head section.

6. Release the pressure in the head section. The applicable head section inflates slightly within 30 seconds.

   Yes **No**
   ↓ → Check for an improper electrical connection. Check for a kinked hose. Replace the air source blower.

7. Articulate the head section to 70°. After 30 seconds, wipe your hand firmly across the air mattress to verify that the three zones—head, thigh, and seat are inflated. The head zone section has a lower (softer) pressure than the seat zone.

   Yes **No**
   ↓ → Calibrate the position sensors.

8. The system functions properly.

   Yes **No**
   ↓ → Replace the sensor and calibrate. See “Articulation Position Sensing System Calibration” on page 4-11.

9. Press the **Max-inflate** control on the intermediate siderail. After 30 seconds, wipe your hand across the foot section from the knee joint to the footboard, and verify that the three zones are inflated to a high pressure.

   Yes **No**
   ↓ → Calibrate the position sensors.

10. The system functions properly.

    Yes No
    ↓ → Replace the sensor, and calibrate as necessary. See “Articulation Position Sensing System Calibration” on page 4-11.

11. Go to “Final Actions” on page 2-18.

Air System Function Check

This test confirms that the air system is working properly, and it does not leak.

If the **service required** indicator flashes at any time during this procedure, go to the fault code table and perform the corrective action (see table 2-3 on page 2-22).

1. Initial actions have been performed.

   Yes No
   ↓ → Go to “Initial Actions” on page 2-8.

2. Unplug the left power cord from its power source. The **Unplugged AC** indicator is on.

   Yes No
   ↓ → Recharge the battery.

3. Perform the following:
   a. Set the brakes.
   b. Inspect for obvious problems such as loose connections or damaged components.
   c. Plug the system power cord into an appropriate power source. The surface initialization takes approximately 30 seconds.
   d. Ensure all air hoses are properly routed and that no kinks are present.

4. Press the Max-inflate control on the intermediate siderail. The blower turns off in less than 2 minutes.

   Yes No
   ↓ → Go to RAP 2.2.

5. Press the Normal mode. The Normal mode is active.

   Yes No
   ↓ → Go to RAP 2.2.

6. Retract the foot section any amount. The Heel Suspension mode is active and the blower turns off in less than 5 minutes.

   Yes **No**
   ↓ → Go to RAP 2.2.

7. The blower remains off for an additional 5 minutes.

NOTE:
Any patient movement may cause the blower to turn on prematurely.

   Yes **No**
   ↓ → Go to RAP 2.2.

8. Go to “Final Actions” on page 2-18.

Foot Section

This test confirms that the air module board has sent the proper air pressures to inflate the foot air cushions and has operated of the various other features.

If the **service required** indicator flashes at any time during this procedure, go to the fault code table and perform the corrective action (see table 2-3 on page 2-22).

1. Initial actions have been performed.

   Yes **No**
   ↓ → Go to “Initial Actions” on page 2-8.

2. Unplug the left power cord from its power source. The **Unplugged AC** indicator is on.

   Yes **No**
   ↓ → Recharge the battery.

3. Perform the following:
   a. Set the brakes.
   b. Inspect for obvious problems, such as loose connections or damaged components.
   c. Plug the system power cord into an appropriate power source.
   d. All air hoses are properly routed and not kinked.

   Yes **No**
   ↓ → Proceed to RAP 2.2.

4. Articulate the head section to the flat position and the foot section to the fully extended position.
5. Proceed to RAP 2.25.
6. Go to “Final Actions” on page 2-18.

Final Actions

1. Complete the required preventive maintenance procedures. See “Preventive Maintenance Checklist” on page 6-41.
2. Complete all required administrative tasks.

Fault Codes

The TotalCare® Bed System employs a detection system for determining any faults associated with the various system modules that function as sub-systems of the TotalCare® Bed System. These faults are transmitted from the faulted module to the TotalCare® Bed System communication network and are then displayed through the **Service required** indicator and/or the Graphical Caregiver Interface (GCI)® Control.

The TotalCare® Bed System alerts the caregiver to a system fault by repeatedly pulsing the **Service required** indicator on the intermediate caregiver siderail panel. The fault message can then be accessed through the **Service required** indicator by depressing the **Head lockout** and the **Knee lockout** controls simultaneously. After a 3-second delay, the numeric fault message is then displayed in a coded series of flashes through the **Service required** indicator. The number of the module initiating the fault is displayed first and is found by counting the number of flashes emitted by the **Service required** indicator (see table 2-2 on page 2-20)). After a 1-second delay, a series of flashes displays the numeric value of the first fault code group, which could be a number between 1 and 15. After another 1-second delay, another series of flashes displays the numeric value of the second, final fault code group, 1-15. After a 3-second delay, the **Service required** indicator repeats the complete fault code one time. Use table 2-3 on page 2-22 to look up the fault code. Find the row containing the three group fault code number and fault description. Perform the applicable RAP to implement the corrective actions.

If the Graphical Caregiver Interface (GCI)® Control option is installed, the diagnostic Graphical Caregiver Interface (GCI)® Control screens can be queried for system status information. To access the Graphical Caregiver Interface (GCI)® Control Code screens, press and hold the **UP** and **DOWN** arrow for 15 seconds. When selected, the diagnostic menu shows fault messages listed in numerical sequence and by fault code name. Corrective actions are provided within this chapter.

Module Identification

The module identification numbers used for fault isolation codes (see table 2-3 on page 2-22) are described in table 2-2 on page 2-20.

Table 2-2. Table of Module Identification Numbers

Module ID Number		**Module Identification Description**
LED	**Graphical Caregiver Interface (GCI)® Control**	
1	10	Power control module
2	20	Right intermediate siderail module
3	30	Left intermediate siderail module
4	40	Graphical Caregiver Interface (GCI)® Control
5	50	Weigh frame module
6	60	Reserved
7	70	Reserved
8	80	Patient air surface module with foot therapy (see RAP 2.1, RAP 2.2, and RAP 2.4)
9	90	Communication (P1900D model only)
9	91	TFM 8051 (P1900D model only)
9	92	PPM (P1900D model only)
9	93	PRM (P1900D model only)
9	94	PBM (P1900D model only)
9	95	TTM (P1900D model only)
16	G0	Pendant

Fault Codes

Using table 2-3 on page 2-22, table 2-4 on page 2-51, or table 2-5 on page 2-52, locate the module number in the first column, **Select Group** (1 to 5). Find the second blinked fault code number in the second column, **Code Group 1**, (1 to 10). Find the final, third, blinked fault code number in the third column, **Code Group 2** (1 to 15). A description of the cause/action for the fault code is found in column 4, **Description of Service Required Fault Code**.

The Graphical Caregiver Interface (GCI)® Control fault codes are listed under the **GCI Control Code** columns of 2. The **ID** column lists the numeric identifier of the module affected, as referenced in table 2-2 on page 2-20, and the **Field 1** column lists the type of fault encountered (see table 2-3 on page 2-22).

NOTE:
For the fault code ID 80, Patient air surface module with foot therapy, see RAP 2.1, RAP 2.2, and RAP 2.4.

Table 2-3. Fault Code Descriptions (P1900A, P1900B, and P1900C)

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	**Field #1**
1	1	1	**Position sensor calibration mode**—Proceed with the position sensor calibration procedure.	10	17
1	1	2	**Bed position sensors not calibrated**—Calibrate position sensors. If problem persists, check sensors and/or cabling. If problem persists replace power control module (PCM) P.C. board (refer to procedure 4.47).	10	18
1	1	3	**Network termination fault**—Check for additional fault codes, check that left user control module (UCM), SideCom® Communication System module (SCM), and treatment foot surface control module (TFSCM) is operational; check that jumper plugs are installed properly at weigh frame junction P.C. board, and check all network cabling.	10	19
1	1	4	**FPGA configuration failure**—Cycle power. If the problem persists, replace the PCM P.C. board (refer to procedure 4.47).	10	20
1	1	5	**Solenoid update command to PIC failure**—Cycle power. If the problem persists, replace the PCM P.C. board (refer to procedure 4.47).	10	21
1	1	6	**Serial EEPROM write failure**—Check for additional fault codes or possible lockout failure, and replace the PCM P.C. board (refer to procedure 4.47).	10	22
1	1	7	**Serial EEPROM read failure**—Check for additional fault codes, possible lockout failure, and replace the PCM P.C. board (refer to procedure 4.47).	10	23
1	1	8	**Serial EEPROM confirm test failure**	10	24
1	1	9	**Neuron self-test failure**	10	25
1	1	10	**Neuron EEPROM failure**	10	26
1	1	11	**Lockout failure, EEPROM corrupted or uninitialized**—Verify lockout operation. If the problem persists, replace the PCM P.C. board (refer to procedure 4.47).	10	27

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
1	1	12	**Calibration Recall failure**—EEPROM failure	10	28
1	1	13	**PSS Configuration failure**—EEPROM failure	10	29
1	2	1	**Position sensor failure**—The head position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no problem found, reset the bed, and attempt to duplicate the fault.	10	33
1	2	2	**Position sensor failure**—The knee position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no problem is found, reset the bed, and attempt to duplicate the fault.	10	34
1	2	3	**Position sensor failure**—The foot articulation position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no is problem found, reset the bed, and attempt to duplicate the fault.	10	35
1	2	4	**Position sensor failure**—The foot retraction position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no problem is found, reset the bed, and attempt to duplicate the fault.	10	36
1	2	5	**Position sensor failure**—The foot hilow position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no problem is found, reset the bed, and attempt to duplicate the fault.	10	37

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
1	2	6	**Position sensor failure**—The head hilow position sensor voltage is out of range. Check the sensor mechanism, sensor output, and cabling. The sensor output should be between 0.5V DC and 4.5V DC. If no problem is found, reset the bed, and attempt to duplicate the fault.	10	38
*	*	*	Head section not moving or moving too slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	49
*	*	*	Knee section not moving or moving slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	50
*	*	*	Foot Articulation section not moving or moving slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	51
*	*	*	Foot retraction section not moving or moving slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	52
*	*	*	Foot hilow section not moving or moving too slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	53
*	*	*	Head hilow section not moving or moving too slowly—If section is not moving at all, check for hydraulic problem. If hydraulics seem satisfactory, replace PCM.	10	54
1	3	7	**Unintentional movement of head section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	55

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	**Field #1**
1	3	8	**Unintentional movement of knee section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	56
1	3	9	**Unintentional movement of foot articulation section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	57
1	3	10	**Unintentional movement of foot retraction section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	58
1	3	11	**Unintentional movement of foot hilow section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	59
1	3	12	**Unintentional movement of head hilow section**—Check for head wall or foot obstructions. Check for loose sensors and/or mechanisms. Check for stuck solenoid valves.	10	60
1	4	1	**Communication failure RT_UCM**—Check for right UCM fault code. Check cabling. If problem persists replace the right UCM.	10	65
1	4	2	**Communication failure with LT_UCM**—Check for left UCM fault code. Check cabling. If problem persists, replace the left UCM.	10	66
1	4	3	**Communication failure with Graphical Caregiver Interface (GCI)® Control**—Check cabling. If problem persists, replace the GCIM.	10	67
1	4	4	**Communication failure with Scale Module**—Check cabling. If problem persists, replace the SM.	10	68
1	4	6	**Communication failure with SideCom® Communication System Module**—Check cabling. If problem persists, replace the SCM.	10	70

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
1	4	7	**Communication failure with TFSCM**—Check cabling. If problem persists, replace the TFSCM.	10	71
1	4	8	**Communication failure with PIC (PIC QUERY)**—Cycle power. If problem persists, replace the PCM P.C. board.	10	72
1	4	9	**Communication failure with PIC (UPDATE)**—Cycle power. If problem persists, replace the PCM P.C. board.	10	73
1	4	10	**Communication failure with caregiver pendant**—Check cabling. Test alternate auxiliary network connector. If problem persists replace the caregiver pendant.	10	74
1	4	11	**Communication failure with patient pendant**—Check cabling. Test alternate auxiliary network connector. If problem persists, replace the patient pendant.	10	75
1	5	1	**+15V battery Voltage failure**	10	81
1	5	2	**+8.5V battery Voltage failure**	10	82
1	5	3	**PCM node disabled**—Diagnostic mode entered	10	83
2	2	1	Replace right caregiver P.C. board	20	33
2	2	2	Replace right caregiver P.C. board	20	34
2	2	3	Replace right caregiver P.C. board	20	35
2	2	4	Replace right caregiver P.C. board	20	36
2	3	1	Replace right caregiver P.C. board	20	49
2	4	1	**Loss of communication with PCM**—Check cabling. If the problem persists, replace the right caregiver P.C. board.	20	65
2	7	2	Replace right caregiver P.C. board	20	85
2	7	1	Replace right caregiver P.C. board	20	113
3	2	1	Replace left caregiver P.C. board.	30	33
3	2	2	Replace left caregiver P.C. board.	30	34
3	2	3	Replace left caregiver P.C. board.	30	35

Select Group	Code Group	Code Group	Description of Service Required Fault Code	GCI Control Code	
	#1	#2		ID	Field #1
3	2	4	Replace left caregiver P.C. board.	30	36
3	3	1	Replace left caregiver P.C. board.	30	49
3	4	1	**Loss of communication with PCM**—Check cabling. If the problem persists, replace the left caregiver P.C. board.	30	65
3	7	2	Replace left caregiver P.C. board.	30	85
3	7	1	Replace left caregiver P.C. board.	30	113
5	1	1	**Incorrect starting address for page size**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	17
5	1	2	**Address out of range**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	18
5	1	3	**EEPROM busy too long**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	19
5	1	4	**EEPROM address not valid**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	20
5	1	5	**Neuron reset**—Indicates neuron went through reset. Normal on power up.	50	21
5	1	6	**Software generated reset**—Software caused the neuron to reset. This can occur due to Electro Static Discharge (ESD) event; however, it should not happen very often. Could indicate problem with A/D converter if it happens consistently.	50	22
5	1	7	**A/D time-out**—Invalid operation. This condition should not occur on a working board. Remove power, and reset the scale. If error is repeatable, replace the board.	50	23
5	1	8	**Could not read serial EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	24

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
5	1	9	**EEPROM busy too long**—Invalid operation. This condition should not occur on a working board. Remove power, and reset the scale. If error is repeatable, replace the board.	50	25
5	1	10	**Number of bytes to read out of range**—Invalid operation, This condition should not occur on a working board. If error is repeatable, replace the board.	50	26
5	1	11	**Number of bytes to read out of range**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	27
5	1	12	**EEPROM busy too long**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	28
5	1	13	**PED check sums do not match**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	29
5	1	14	**Error getting beam readings**—Look at additional error codes in the GCI or Service Required value field.	50	30
5	1	15	**Invalid diagnostic command**—A diagnostic command that it does not support was sent to the scale.	50	31
5	2	1	**Invalid range for A/D reading**—Possible causes are too much weight on section of bed, beam failure, board failure, or no weight on beams. Use diagnostics to read the A/D values, and determine which beam is generating the invalid reading.	50	33
5	2	2	**Non-valid diagnostic command**—A diagnostic command that the scale did not recognize was sent.	50	34
5	2	3	**Floating point error, weight calc range error**—Scale cannot calculate the weight, there is too much weight on the bed, the bed was not zeroed, or there is an open beam.	50	35

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code ID	GCI Control Code Field #1
5	2	4	**Constructor returned error, invalid ranges**—The zero reading, A/D reading, or coefficients are not in range. Look at additional error codes in the Graphical Caregiver Interface (GCI)® Control or Service Required value field.	50	36
5	2	6	**General calibration error, beam readings, zero readings, max values**—Error during calibration. Use the Graphical Caregiver Interface (GCI)® Control to view the error history and additional error codes.	50	38
5	2	7	**Try to get PED readings, A/D error returned**—The A/D reading is not available. Look at additional error codes in the Graphical Caregiver Interface (GCI)® Control or Service Required value field.	50	39
5	2	8	**Tried to get A/D readings**—The A/D timed out. Use diagnostics to view the A/D readings. Apply weight to the bed to see if A/D readings change. A scale board power reset re-initializes the A/D; however, if the problem still persists, replace the board.	50	40
5	2	9	**Initial PED weight error**—PED requires a minimum weight on the bed to be enabled. The bed may need to be zeroed, or there may be a board/beam/frame problem.	50	41
5	2	10	**Alarm generated too many errors detected**—Errors were detected while monitoring PED. Look at additional error codes in the Graphical Caregiver Interface (GCI)® Control or Service Required value field.	50	42
5	2	11	**PED weight too small**—PED was not enabled because the scale did not measure 50 lb or more on the bed. Perform a weigh function, and measure the weight on the bed. Rezero the bed.	50	43
5	2	13	**PED_construct error reading set weigh offset, EEEPROM error**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	45

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	3	3	**SAVE_PED error writing**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	51
5	3	4	**Save_coefficient_values**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	52
5	3	5	**Save_zero_values**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	53
5	3	6	**Save_beam_rdgs**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	54
5	3	7	**Save_offset_adj**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	55
5	3	8	**Save_offset_adj**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	56
5	3	9	**GET_ZERO_VALUES could not confirm**—Zero readings were not the same in at least two of the three serial EEPROM locations. Zero the bed again and run the board self-test from diagnostics. If problem persists, replace the board.	50	57
5	3	10	G**ET_ZERO_VALUES could not read**—Bed needs to be zeroed again. If problem persists, replace the board.	50	58
5	3	11	**GET_PED_VALUES could not confirm**—PED parameters were not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. If problem persists, replace the board.	50	59
5	3	12	**GET_PED_VALUES could not read**—Enable PED again. If problem persists, replace the board.	50	60

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code ID	GCI Control Code Field #1
5	3	13	**Coefficient could not confirm**—The coefficient value was not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. If it passes, calibrate the scale again; if the error still persists, replace the board.	50	61
5	3	14	**Coefficient could not read**—Run the board self-test from diagnostics. If the board passes, verify the calibration coefficients using the diagnostic commands. If problem persists, replace the board.	50	62
5	3	15	**GET_OFFSET_ADJ_VALUES could not confirm**—The offset value was not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. If it passes, zero the scale again; if the error still persists, replace the board.	50	63
5	4	1	**GET_OFFSET_ADJ_VALUES could not confirm last weight**—The last weight value was not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. If it passes, weigh the patient again; if the error still persists, replace the board.	50	65
5	4	2	**GET_OFFSET_ADJ_VALUES could not confirm**—The offset value was not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. If it passes, zero the scale again; if the error still persists, replace the board.	50	66
5	4	3	**GET_OFFSET_ADJ_VALUES could not read last weight**—Reweigh the patient. If problem persists, replace the board.	50	67

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	4	4	**GET_BEAM_RDGS could not confirm**—The calibration beam readings were not the same in at least two of the three serial EEPROM locations. Run the board self-test from diagnostics. This is not a fatal error; calibration data may be lost, but coefficients may be intact. Check the coefficient values with diagnostics.	50	68
5	4	5	**GET_BEAM_RDGS could not read**—Could not read the calibration beam readings. Run the board self-test from diagnostics.	50	69
5	4	6	**EEPROM_WRITE_BYTE could not write**—Could not write the value to EEPROM. Run the board self test from diagnostics.	50	70
5	4	7	**EEPROM_READ_BYTE could not read**—Could not read the EEPROM value. Run the board self-test from diagnostics.	50	71
5	4	8	**EEPROM_TEST error saving**—EEPROM failure, replace the board.	50	72
5	4	9	**EEPROM_TEST error confirming**—EEPROM failure, replace the board.	50	73
5	4	10	**EEPROM_TEST write/read compare**—EEPROM failure, replace the board.	50	74
5	4	11	**Coefficients not in range after calculated**—The coefficients were calculated but the range is not valid. The beam readings may not have changed during calibration (a result of board failure, a faulty beam, or frame error). Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings and verify they change when weight is added above each beam.	50	75
5	4	12	**WEIGH_ZERO_CMD no zero with PED on**—The bed cannot be zeroed with PED on.	50	76

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
5	4	13	**Error taking weight, PED_STATE_INITIAL_NO_WEIGHT**—Try a weigh function, and check error codes. Reset the scale. If problem continues, check A/D readings with diagnostic commands.	50	77
5	4	14	**EEPROM_TEST read error**—EEPROM failure, replace the board.	50	78
5	4	15	**VALID_COEFFICIENT, ch0 not in range**—Coefficient is not in valid range. Use diagnostics to view the calibration coefficients. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings, and verify that they change when weight is added above each beam. Calibrate the bed again.	50	79
5	5	1	**VALID_COEFFICIENT,ch1 not in range**—Coefficient is not in valid range. Use diagnostics to view the calibration coefficients. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings, and verify that they change when weight is added above each beam. Calibrate the bed again.	50	81
5	5	2	**VALID_COEFFICIENT, ch2 not in range**—Coefficient is not in valid range. Use diagnostics to view the calibration coefficients. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings, and verify they change when weight is added above each beam. Calibrate the bed again.	50	82
5	5	3	**VALID_COEFFICIENT, ch3 not in range**—Coefficient is not in valid range. Use diagnostics to view the calibration coefficients. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings, and verify they change when weight is added above each beam. Calibrate the bed again.	50	83

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	**Field #1**
5	5	4	**Zero ch0, not in range**—Zero for right foot is not in a valid range. Zero the bed again. This could be a serial EEPROM error. Run the board self-test from diagnostics.	50	84
5	5	5	**Zero ch1, not in range**—Zero for left foot is not in a valid range. Zero the bed again. This could be a serial EEPROM error. Run the board self-test from diagnostics.	50	85
5	5	6	**Zero ch2, not in range**—Zero for left head is not in a valid range. Zero the bed again. This could be a serial EEPROM error. Run the board self-test from diagnostics.	50	86
5	5	7	**Zero ch3, not in range**—Zero for right head is not in a valid range. Zero the bed again. This could be a serial EEPROM error. Run the board self-test from diagnostics.	50	87
5	5	8	**VALID_AD_RDGS, readings ch0**—A/D beam readings for right foot are not in range. Could be too much weight on bed, A/D error, or beam failure. Run the board self test from diagnostics.	50	88
5	5	9	**VALID_AD_RDGS, readings ch1**—A/D beam readings for left foot are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self test from diagnostics to determine which it is.	50	89
5	5	10	**VALID_AD_RDGS, readings ch2**—A/D beam readings for left head are not in range. Could be too much weight on bed, A/D error, or beam failure. Run the board self-test from diagnostics.	50	90
5	5	11	**VALID_AD_RDGS, readings ch3**—A/D beam readings for right head are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self-test from diagnostics.	50	91

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	5	12	**PED readings ch0, not in range**—A/D beam readings for right foot are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self-test from diagnostics.	50	92
5	5	13	**PED readings ch1, not in range**—A/D beam readings for left foot are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self-test from diagnostics.	50	93
5	5	14	**PED readings ch2, not in range**—A/D beam readings for left head are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self-test from diagnostics.	50	94
5	5	15	**PED readings ch3, not in range**—A/D beam readings for right head are not in range. There could be too much weight on bed, or A/D error, or a beam failure. Run the board self-test from diagnostics.	50	95
5	6	1	**Error writing to EEPROM**—Check with diagnostic self test. If self-test fails, replace the board.	50	97
5	6	2	**SAVE_PED_DELAY writing to EEPROM**—Enable PED again. If problem persists, run diagnostic self-test. Then replace the board.	50	98
5	6	3	**Could not save PED state bits to EEPROM**—Enable PED again. If problem persists, run diagnostic self-test. Then replace the board.	50	99
5	6	4	**Could not save to EEPROM, SAVE_PED_INIT_WEIGHT**—Enable PED again. If problem persists, run diagnostic self-test. Then replace the board.	50	100
5	6	5	**PED_STATE_MONITOR, could not start PED, maximum PED error**—Run diagnostic self-test and check A/D readings. If problem persists, replace the board.	50	101

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
5	6	6	**Could not load beam readings or zero from cal data, EEPROM error**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	102
5	6	7	**Enabled PED and PCM not detected**—The scale cannot communicate with the PCM. Bed Exit cannot be enabled if the PCM is not detected.	50	103
5	6	9	**Time-out response from PCM**—Communication error that may not be related to scale. Check PCM.	50	105
5	6	10	**Time-out response from SCM**—Communication error that may not be related to scale. Check SCM.	50	106
5	6	11	**SAVE_SERIAL_NUMBER, error writing to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	107
5	6	12	**GET_SERIAL_NUMBER—confirm failed**—Invalid operation—this condition should not occur on a working board. If error is repeatable, replace the board.	50	108
5	6	13	**GET_SERIAL_NUMBER—read time-out**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	109
5	6	15	**SAVE_ERRORS—EEPROM time-out**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	111
5	7	1	**GET_ERROR—confirm failed**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	113
5	7	2	**GET_ERROR—read time-out**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	114

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	7	3	**SAVE_ALARM—write time-out**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	115
5	7	4	**GET_ALARM—confirm failed**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	116
5	7	5	**GET_ALARM—read time-out**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	117
5	7	6	**Unrecognized command passed**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	118
5	7	7	**EEPROM error, offset**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	119
5	7	8	**EEPROM error, zero**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	120
5	7	9	**EEPROM error, coefficient**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	121
5	7	10	**Range for zero or coefficient is not valid**—Zero the bed, and run diagnostic self-test. Verify A/D readings with diagnostics. If problem persists, replace the board.	50	122
5	7	11	**Could not save weight, EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	123
5	7	12	**Could not save coefficients to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	124

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	**Field #1**
5	7	13	**Could not save calibration data/beam readings to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	125
5	7	14	**WEIGH_ZERO_CMD error saving offset, EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	126
5	7	15	**WEIGH_ZERO_CMD could not save zero to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	127
5	8	1	**Could not get zero from EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	129
5	8	2	**Could not get coefficients from EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	130
5	8	4	**Could not save serial number to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	132
5	8	5	**Could not write to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	133
5	8	6	**Could not read from EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	134
5	8	7	**Could not write to EEPROM, new board test**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	135

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code ID	GCI Control Code Field #1
5	8	8	**Could not read from EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	136
5	8	9	**A/D power up reset error**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	137
5	8	10	**Could not read serial number from EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, replace the board.	50	138
5	8	11	**Error getting A/D readings**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	139
5	8	13	**Error saving PED data to EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	141
5	8	14	**EEPROM write error, could not update coefficients**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	142
5	8	15	**Calculated weight too large, > 327.67 kg**—Scale cannot calculate the weight because there is too much weight on the bed, the bed was not zeroed, or there is an open beam.	50	143
5	9	1	**Weight—RF || invalid range RF**—Calibration weight was added to the right foot, and the RF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	145

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	9	2	**Weight—RF || invalid range LF**—Calibration weight was added to the right foot, and the LF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	146
5	9	3	**Weight—RF || invalid range LH**—Calibration weight was added to the right foot, and the LH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	147
5	9	4	**Weight—RF || invalid range RH**—Calibration weight was added to the right foot, and the RH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	148
5	9	5	**Weight—LF || invalid range RF**—Calibration weight was added to the left foot, and the RF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	149
5	9	6	**Weight—LF || invalid range LF**—Calibration weight was added to the left foot, and the LF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	150

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	9	7	**Weight—LF || invalid range LH**—Calibration weight was added to the left foot, and the LH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	151
5	9	8	**Weight—LF || invalid range RH**—Calibration weight was added to the left foot, and the RH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	152
5	9	9	**Weight—LH || invalid range RF**—Calibration weight was added to the left head, and the RF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	153
5	9	10	**Weight—LH || invalid range LF**—Calibration weight was added to the left head, and the LF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	154
5	9	11	**Weight—LH || invalid range LH**—Calibration weight was added to the left head, and the LH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	155

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
5	9	12	**Weight—LH || invalid range RH**—Calibration weight was added to the left head, and the RH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	156
5	9	13	**Weight—RH || invalid range RF**—Calibration weight was added to the right head, and the RF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	157
5	9	14	**Weight—RH || invalid range LF**—Calibration weight was added to the right head, and the LF beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	158
5	9	15	**Weight—RH || invalid range LH**—Calibration weight was added to the right head, and the LH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	159
5	10	1	**Weight—RH || invalid range RH**—Calibration weight was added to the right head, and the RH beam reading was invalid. This could be a beam, board, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	161
5	10	3	**Cal zero RF not valid**—Zero value for the right foot beam was not valid. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	163

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
5	10	4	**Cal zero LF not valid**—Zero value for the left foot beam was not valid. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	164
5	10	5	**Cal zero LH not valid**—Zero value for the left head beam was not valid. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	165
5	10	6	**Cal zero RH not valid**—Zero value for the right head beam was not valid. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings.	50	166
5	10	7	**Right foot max in wrong place**—During calibration the weight was placed over the right foot, and this beam did not indicate the maximum reading. The beam wires connected to the board may be in the wrong location, or the calibration weight was placed in the wrong position during calibration.	50	167
5	10	8	**Left foot max in wrong place**—During calibration the weight was placed over the left foot, and this beam did not indicate the maximum reading. The beam wires connected to the board may be in the wrong location, or the calibration weight was placed in the wrong position during calibration.	50	168
5	10	9	**Left head max in wrong place**—During calibration the weight was placed over the left head, and this beam did not indicate the maximum reading. The beam wires connected to the board may be in the wrong location, or the calibration weight was placed in the wrong position during calibration.	50	169

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
5	10	10	**Right head max in wrong place**—During calibration the weight was placed over the right head, and this beam did not indicate the maximum reading. The beam wires connected to the board may be in the wrong location, or the calibration weight was placed in the wrong position during calibration.	50	170
5	10	11	**Error saving calibration zero data**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	171
5	10	12	**Error confirming calibration zero data**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	172
5	10	13	**Error getting calibration zero data**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	173
5	10	14	**WEIGH_SETWEIGHT_CMD error saving offset, EEPROM**—Invalid operation. This condition should not occur on a working board. If error is repeatable, after power reset, replace the board.	50	174
5	10	15	**FP error calculating coefficients**—The coefficients cannot be calculated. The beam readings may not have changed during calibration because of — board failure, a faulty beam, or frame error. Run the board self-test from diagnostics to test the board. Use diagnostics to view the beam A/D readings and verify that they change when weight is added above each beam.	50	175
8	1	1	**TFSCM pressure valve home position from closed failure** -TFSCM stepper motor problem, check cabling, replace module	80	17

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code ID	GCI Control Code Field #1
8	1	2	**TFSCM vacuum valve home position from closed failure** -TFSCM stepper motor failure - TFSCM cable disconnected - TFSCM valve control common disconnected - Vacuum valve control disconnected	80	18
8	1	3	**TFSCM pressure valve early close warning** - TFSCM stepper motor problem, check cabling, replace module	80	19
8	1	4	**TFSCM pressure valve early close failure** - TFSCM stepper motor problem, check cabling, replace module	80	20
8	1	5	**TFSCM vacuum valve early close warning** - TFSCM stepper motor problem, check cabling, replace module	80	21
8	1	6	**TFSCM vacuum valve early close failure** - TFSCM stepper motor problem, check cabling, replace module	80	22
8	1	7	**TFSCM pressure valve late close failure** - TFSCM stepper motor problem, check cabling, replace module	80	23
8	1	8	**TFSCM vacuum valve late close failure** - TFSCM stepper motor problem, check cabling, replace module	80	24
8	1	9	**TFSCM both valves open (both controls contacted)** - TFSCM stepper motor problem, check cabling, replace module	80	25
8	2	1	**TSCM pressure valve home position from closed failure** - TSCM stepper motor problem, check cabling, replace module	80	33
8	2	2	**TSCM vacuum valve home position from closed failure** -TSCM stepper motor problem, check cabling, replace module	80	34
8	2	3	**TSCM pressure valve early close warning** - TSCM stepper motor problem, check cabling, replace module	80	35

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
8	2	4	**TSCM pressure valve early close failure** - TSCM stepper motor problem, check cabling, replace module	80	36
8	2	5	**TSCM vacuum valve early close warning** - TSCM stepper motor problem, check cabling, replace module	80	37
8	2	6	**TSCM vacuum valve early close failure** - TSCM stepper motor problem, check cabling, replace module	80	38
8	2	7	**TSCM pressure valve late close failure** - TSCM stepper motor problem, check cabling, replace module	80	39
8	2	8	**TSCM vacuum valve late close failure** - TSCM stepper motor problem, check cabling, replace module	80	40
8	2	9	**TFSCM both valves open (both controls contacted)** - TSCM stepper motor problem, check cabling, replace module	80	41
8	3	1	LARCM removed while operating in therapy mode	80	49
8	3	2	HARCM removed while operating in therapy mode	80	50
8	3	3	PVCM removed while operating in therapy mode	80	51
8	3	4	AUX 1 removed while operating in therapy mode	80	52
8	3	5	AUX 2 removed while operating in therapy mode	80	53
8	3	6	**Communication failure** - Missed message warning (P.C.M limit control status) - Check base to weigh frame signal cable, check continuity LONA and LONB signals from P2 to P8 through right siderail - Defective board - Check weigh frame to surface cable connections - Defective P.C. board - Defective cable - Missing jumper	80	54
8	3	7	**Communication failure (P.C.M Limit control Status)** - Check base to weigh frame signal cable - Defective P.C. board	80	55

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
8	3	8	**Communication failure** - Missed message warning (P.C.M articulation status) - Check base to weigh frame signal cable - Defective P.C. board	80	56
8	3	9	**Communication failure (P.C.M articulation status)** - Check base to weigh frame signal cable - Defective P.C. board	80	57
8	3	10	**Communication failure** - Missed message warning (P.C.M bed status) -Check base to weigh frame signal cable - Defective P.C. board	80	58
8	3	11	**Communication failure (P.C.M bed status)** - Check base to weigh frame signal cable - Defective P.C. board -Check continuity LONA and LONB signals from P2 to P8 through right siderail - Defective P.C. board - Check weigh frame to surface cable connections - Defective P.C. board - Defective cable - Missing jumper - Defective P.C.M	80	59
8	3	12	**Communication failure** - Missed message warning (right UCM control status) - Check continuity LONA and LONB signals from P2 to P8 through right siderail - Defective P.C. board - Check weigh frame to surface cable connections - Defective P.C. board - Defective cable - Missing jumper - Defective right UCM	80	60
8	3	13	**Communication failure** - Missed message warning (left UCM control status) -Check left intermediate siderail cable LONA, LONB. Defective left UCM	80	61
8	3	14	**Missed message warning (GCI control status) -** Check left intermediate siderail cable LONA, LONB. Replace cable - Check GCI cable - Right UCM not sending signal - Defective right UCM	80	62
8	3	15	**Communication failure (No UCM control status)** - Check right intermediate siderail cable LONA, LONB. Replace cable.	80	63
8	4	1	Reserved	80	65

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
8	4	2	Reserved	80	66
8	4	3	Reserved	80	67
8	4	4	Reserved	80	68
8	4	6	Reserved	80	70
*	*	*	Reserved	80	71
8	4	8	Reserved	80	72
*	*	*	Reserved	80	73
8	4	10	Reserved	80	74
8	5	1	**Neuron memory corrupt warning** - Replace TFSCM module	80	81
8	5	2	**Neuron memory corrupt failure** - TFSCM control failure. Replace TFSCM module	80	82
8	5	3	**TSCM memory corrupt warning** - Replace TFSCM module	80	83
8	5	4	**TSCM memory corrupt failure**. Replace TFSCM module	80	84
8	5	5	**Bad TFSCM transducer calibration** - Replace TFSCM module	80	85
8	5	6	**Bad TSCM transducer calibration** - Replace TSCM module	80	86
8	6	1	Manifold pressure is below set point for more than 5 Seconds - Check manifold tubing - Replace manifold - Check blower. RAP 2.4.	80	97
8	6	2	Air source can not reach manifold pressure set-point change within 12 seconds - Check manifold tubing - - Replace manifold - Check blower. RAP 2.4.	80	98
8	7	1	**Pressure override warning** - Check manifold tubing - Replace manifold - Check blower. Perform leak test.	80	113
8	7	2	**Maximum inflate count exceeded** - Check manifold tubing - Replace manifold - Check blower. RAP 2.2.	80	114
8	7	3	**Cushion inflate failure** - Check manifold tubing - Replace manifold - Check blower	80	115

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	Field #1
8	7	4	**Cushion adjust count exceeded** - Check manifold tubing - Replace manifold - Check blower	80	116
8	8	1	**Initialization failure** - Pressure failure - replace module. RAP 2.2. Perform leak test.	80	129
8	8	2	**Initialization failure** - Pressure failure - replace TSCM module. RAP 2.2. Perform leak test.	80	130
8	9	1	**Initialization failure** - Field #2=004, RAP 2.3. Field #2=008, RAP 2.3.	80	145
8	9	2	Loss of AC power. Check AC power.	80	146
8	1	10	TFSCM invalid switch data	80	26
8	1	11	TFSCM pressure valve will not close warning (switch always contacted)	80	27
8	1	12	TFSCM vacuum valve will not close warning (switch always contacted)	80	28
8	1	13	TFSCM both valves open warning (both switches contacted)	80	29
8	1	14	TFSCM pressure valve will not open warning (switch not contacted)	80	30
8	1	15	TFSCM vacuum valve will not open warning (switch not contacted)	80	31
8	2	10	TSCM invalid switch data	80	42
8	2	11	TSCM pressure valve will not close warning (switch always contacted)	80	43
8	2	12	TSCM vacuum valve will not close warning (switch always contacted)	80	44
8	2	13	TSCM both valves open warning (both switches contacted)	80	45
8	2	14	TSCM pressure valve will not open warning (switch not contacted)	80	46
8	2	15	TSCM vacuum valve will not open warning (switch not contacted)	80	47
8	4	5	Missed message warning (PVCM status)	80	69

Select Group	**Code Group #1**	**Code Group #2**	**Description of Service Required Fault Code**	**GCI Control Code**	
				ID	**Field #1**
8	10	5	TFSCM pressure valve late close failure	80	161
8	10	6	TFSCM vacuum valve late close failure	80	162
8	10	7	TFSCM pressure valve late close warning	80	163
8	10	8	TFSCM vacuum valve late close warning	80	164
8	10	9	TSCM pressure valve late close failure	80	165
8	10	10	TSCM vacuum valve late close failure	80	166
8	10	11	TSCM pressure valve late close warning	80	167
8	10	12	TSCM vacuum valve late close warning	80	168

Table 2-4. Pendant Error Codes

Select Group	Code Group #1	Code Group #2	Description of Service Required Fault Code	GCI Control Code	
				ID	**Field #1**
16	2	1	**U1_High row selection logic failure**—Replace the pendant.	G0	33
16	2	2	**U1_Low row selection logic failure**—Replace the pendant.	G0	34
16	2	3	**U2_High row selection logic failure**—Replace the pendant.	G0	35
16	2	4	**U2_Low row selection logic failure**—Replace the pendant.	G0	36
16	3	1	**Col_Fault column shorted high or low**—Replace the pendant.	G0	49
16	4	1	**PCM_Comm_Fail loss of communication UCM to PCM**—Check the pendant cable. If necessary, replace the pendant.	G0	65
16	7	1	**PWR_UP_COL_FAULT column shorted high or low or together**—Replace the pendant.	G0	113
16	9	1	**RELAY_FAULT Nurse Call relay logic failure**—Replace the pendant.	G0	145

Table 2-5. Fault Code Descriptions (P1900D Models Only)

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**17**	Error writing alarm silence to EEPROM	Replace TFSCM/TFM Module.
90	**18**	EEPROM error WRITE_MINUTE_COUNTER	Replace TFSCM/TFM Module.
90	**20**	Error writing therapy counters	Replace TFSCM/TFM Module.
90	**21**	Error writing rotation, WRITE_ROTATION_EE	Replace TFSCM/TFM Module.
90	**22**	Error writing percussion, WRITE_PERCUSSION_EE	Replace TFSCM/TFM Module.
90	**23**	Error writing vibration, WRITE_VIBRATION_EE	Replace TFSCM/TFM Module.
90	**24**	Error writing perc_vib,WRITE_VIB_PERC_EE	Replace TFSCM/TFM Module.
90	**25**	EEPROM busy too long	Replace TFSCM/TFM Module.
90	**26**	Number of bytes to read out of range	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**27**	Number of bytes to read out of range	Reset Bed. Replace TFSCM/TFM if problem persists
90	**28**	EEPROM busy too long	Replace TFSCM/TFM Module.
90	**34**	Default executed in case statement	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**35**	WRITE_SERIAL_EE, error writing serial number	Replace TFSCM/TFM Module.
90	**36**	WRITE_SERIAL_EE	Replace TFSCM/TFM Module.
90	**37**	WRITE_SERIAL_EE	Replace TFSCM/TFM Module.
90	**38**	WRITE_SERIAL_EE	Replace TFSCM/TFM Module.
90	**39**	WRITE_SERIAL_EE	Replace TFSCM/TFM Module.
90	**40**	READ_ROTATION_EE, error reading	Replace TFSCM/TFM Module.
90	**41**	READ_ROTATION_EE, error confirming	Replace TFSCM/TFM Module.
90	**42**	Manifold pressure failure on power up	See Pulmonary Air Pressure Troubleshooting flowchart.
90	**43**	Timed out trying to go to position for pv	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**44**	Default executed in case statement	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**45**	% value for valve opening out of range	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**46**	Bad pressure	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**47**	Bad cmd	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**49**	Cmd queue overflow	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**50**	Bad target specified	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**51**	Stale msg	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**53**	Error reading on_time	Replace TFSCM/TFM Module.
90	**54**	Error reading off_time	Replace TFSCM/TFM Module.
90	**55**	Error reading start_time	Replace TFSCM/TFM Module.
90	**56**	Error reading therapy counters	Replace TFSCM/TFM Module.
90	**57**	Error saving data	Replace TFSCM/TFM Module.
90	**58**	Error saving data	Replace TFSCM/TFM Module.
90	**59**	Error saving data	Replace TFSCM/TFM Module.
90	**60**	Error saving/reading data	Replace TFSCM/TFM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**61**	Error saving data	Replace TFSCM/TFM Module.
90	**62**	Error reading data from EEPROM, during reset	Replace TFSCM/TFM Module.
90	**63**	Error reading data	Replace TFSCM/TFM Module.
90	**65**	Error tfm_module	See Communications Error flowchart on page 2-212.
90	**66**	Error base_module	See Communications Error flowchart on page 2-212.
90	**67**	Error pv_module	See Communications Error flowchart on page 2-212.
90	**68**	Error ttm_module	See Communications Error flowchart on page 2-212.
90	**69**	Error spare_module	See Communications Error flowchart on page 2-212.
90	**70**	Error rot_module	See Communications Error flowchart on page 2-212.
90	**71**	Timeout reading pressures	Reset Bed - Replace TFSCM/TFM if problem persists.
90	**72**	Timeout, eeprom busy too long	Replace TFSCM/TFM Module.
90	**73**	Timeout, eeprom busy too long	Replace TFSCM/TFM Module.
90	**74**	Error writing rotation statistics	Replace TFSCM/TFM Module.
90	**75**	Error writing rotation statistics	Replace TFSCM/TFM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**76**	Error writing rotation statistics	Replace TFSCM/TFM Module.
90	**77**	Error writing rotation statistics	Replace TFSCM/TFM Module.
90	**78**	SPI communication error to rotation module	See Communications Error flowchart on page 2-212.
90	**79**	Detect line connection error to rotation module	See Communications Error flowchart on page 2-212.
90	**81**	SPI communication error to pv module	See Communications Error flowchart on page 2-212.
90	**82**	Detect line connection error to pv module	See Communications Error flowchart on page 2-212.
90	**83**	Error reading/writing values	Replace TFSCM/TFM Module.
90	**84**	Having to resend command to base module for normal mode	See Communications Error flowchart on page 2-212.
90	**85**	Having to resend command to rot module for normal mode	See Communications Error flowchart on page 2-212.
90	**86**	Error writing statistics indices	Replace TFSCM/TFM Module.
90	**87**	Error reading statistics indices	Replace TFSCM/TFM Module.
90	**88**	Day date out of range for READ_TEN_MIN_STATS	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**89**	Error writing diag statistics data	Replace TFSCM/TFM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**90**	Day date out of range for READ_TEN_MIN_STATS	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**91**	Error reading diag statistics data	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**94**	Executed default in switch statement	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**95**	PV state machine error	Reset Bed. Replace PPM if problem persists.
90	**97**	PV state machine, other modules will not stay in correct state during therapy	Reset Bed. Replace PPM if problem persists.
90	**98**	Checksum error with data	Reset Bed - Replace TFSCM/TFM if problem persists
90	**99**	Frequency from tfm or ppm does not match	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**100**	Executed default: in switch statement	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**101**	Executed default: in switch statement, transition section	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**102**	Executed default, in switch statement, timer section	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**103**	Mode or board cmd error, no match for the TFM, timeout	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**104**	Rotation level right out of range	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**105**	Rotation level left out of range	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**106**	Executed default: in switch statement	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**107**	Variable found out of range	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**108**	Error found, index for pv is not valid	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**109**	No TFM communications, illegal configuration	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**110**	No TTM communications, illegal configuration	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**111**	No base communications, illegal configuration rot module, no base	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**113**	No base communications, illegal configuration, pv module, no base	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**114**	PV module installed, but cannot communicate with module.	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**115**	Rotation module installed but cannot communicate with module.	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**116**	Rotation module removed during rotation.	No action required if module not installed, else see Communications Error flowchart on page 2-212 if problem persists.
90	**117**	Loss of PCM communication - bed positions	See RAP 2.38.
90	**118**	Sending data to Graphical Caregiver Interface (GCI)® Control and object_no not valid (2 or 3)	Reset Bed
90	**119**	Timeout, waiting for ready too long	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**120**	Mode or board cmd error,no match for the TTM, timeout	Reset Bed.See Communications Error flowchart on page 2-212 if problem persists.
90	**121**	Mode or board cmd error,no match for the BASE, timeout	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**122**	Mode or board cmd error,no match for the ROTATION, timeout	Reset Bed. See Communications Error flowchart on page 2-212 if problem persists.
90	**123**	Loss of GCI communications	See RAP 2.30.
90	**124**	Loss of siderail left communications	See RAP 2.14.
90	**125**	Loss of siderail right communiction	See RAP 2.14.
90	**126**	WRITE_MINUTE_COUNTER	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**127**	WRITE_ALL_ROT_STATISTICS	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**129**	READ_ALL_ROT_STATISTICS	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**130**	READ_SINGLE_ROT_STATISTICS	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**131**	WRITE_SINGLE_ROT_STATISTICS	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**132**	WRITE_THERAPY_MIN_COUNTER	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**133**	WRITE_OFF_MIN_COUNTER	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**134**	WRITE_DIAG_TIME_STAMP2_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**135**	READ_DIAG_TIME_STAMP2_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**136**	WRITE_ROTATION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**137**	WRITE_PERCUSSION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**138**	WRITE_VIBRATION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**139**	WRITE_STAT_INDEX	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**140**	READ_STAT_INDEX	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**141**	WRITE_MOD_WEIGHT	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**142**	READ_MOD_WEIGHT	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**143**	WRITE_VIB_PERC_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**145**	READ_ROTATION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**146**	READ_PERCUSSION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**147**	READ_VIBRATION_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**148**	READ_VIB_PERC_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**149**	WRITE_SERIAL_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**150**	READ_ALARM_SILENCE_TIME	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**151**	READ_RTC_POWER_DOWN	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**152**	READ_THERAPY_MIN_COUNTER	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**153**	READ_SERIAL_EE	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**154**	Therapy_id variable is not in valid range	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**155**	Index is out of range, fatal error	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**156**	Have PV or Rot module installed but no base	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**157**	Have Rot module installed but no base	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**158**	Error reading qfactor count data	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**159**	Error writing qfactor data	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**161**	Timer_expires()	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**162**	Error writing statistics data to FRAM	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**163**	Timer is not incrementing, error[3] is timer id	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
90	**164**	PPM module removed during pv	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**220**	Switch/case default executed	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**241**	Switch/case default executed	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**245**	Switch/case default executed	Reset Bed. Replace TFSCM/TFM if problem persists.
90	**249**	Switch/case default executed	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**1**	ERR_RS232_OVERFLOW /* warning only */	No action required.
91	**2**	ERR_RS232_BAD_BOF /* warning only */	No action required.
91	**3**	ERR_RS232_BAD_CRC /* warning only */	No action required.
91	**4**	ERR_RS232_TIMEOUT /* warning only */	No action required.
91	**5**	ERR_RS232_BAD_MID /* warning only */	No action required.
91	**17**	ERR_SPI_OVERFLOW /* warning only */	No action required.
91	**18**	ERR_SPI_BAD_BOF /* warning only */	No action required.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**19**	ERR_SPI_BAD_CRC /* warning only */	No action required.
91	**20**	ERR_SPI_TIMEOUT /* warning only */	No action required.
91	**21**	ERR_SPI_BAD_MID /* warning only */	No action required.
91	**32**	ERR_5V_LO /* warning only */	No action required.
91	**33**	ERR_5V_HI /* warning only */	No action required.
91	**34**	ERR_15V_LO /* warning only */	No action required.
91	**35**	ERR_15V_HI /* warning only */	No action required.
91	**48**	ERR_TIMERS_NOT_RUNNING	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**49**	ERR_TEST1 /* test 1 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**50**	ERR_TEST2 /* test 2 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**51**	ERR_TEST3 /* test 3 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**52**	ERR_TEST4 /* test 4 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**53**	ERR_TEST5 /* test 5 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**54**	ERR_TEST6 /* test 6 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**55**	ERR_TEST7 /* test 7 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**56**	ERR_TEST8 /* test 8 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**57**	ERR_TEST9 /* test 9 error code */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**64**	ERR_BLOWER_FAIL	See Pressure Failures flowchart on page 2-213.
91	**65**	ERR_ATOD_FAIL	Replace TFSCM/TFM Module.
91	**66**	ERR_BLOWER_HAZARD	Replace TFSCM/TFM Module.
91	**67**	ERR_PV_PRS_HI /* hi press when PV is OFF */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**68**	ERR_PV_PRS_BAD /* out of range when PV is ON */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**69**	ERR_BAD_CAL_Z1 0x45 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**70**	ERR_BAD_CAL_Z2 0x46 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
91	**71**	ERR_BAD_CAL_Z3 0x47 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
91	**72**	ERR_BAD_CAL_Z4 0x48 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
91	**73**	ERR_BAD_CAL_PV 0x49 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
91	**74**	ERR_BOOST_LOW_PRS 0x4A /* boost prs low during rot */	Reserved. Reset bed. If code reappears, replace TTM.
91	**84**	ERR_Z1_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**85**	ERR_Z2_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**86**	ERR_Z3_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**87**	ERR_Z4_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**88**	ERR_Z1_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TFSCM/TFM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**89**	ERR_Z2_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**90**	ERR_Z3_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**91**	ERR_Z4_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**92**	ERR_BAD_ZONE /* bad zone in motor state machine */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**93**	ERR_BAD_ZONE2 /* bad zone in no new data err */	Reset Bed. Replace TFSCM/TFM if problem persists.
91	**96**	ERR_Z1_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**97**	ERR_Z2_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**98**	ERR_Z3_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**99**	ERR_Z1_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**100**	ERR_Z2_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**101**	ERR_Z3_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**102**	ERR_Z1_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**103**	ERR_Z2_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**104**	ERR_Z3_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM
91	**112**	ERR_Z1_NO_CONTROL /* zone 1 not able to reach setpoint */	Pressure control failure with TFSCM/TFM Heel bladder. See Pressure Failures flowchart on page 2-213.
91	**113**	ERR_Z2_NO_CONTROL /* zone 2 not able to reach setpoint */	Pressure control failure with TFSCM/TFM Retract bladder. See Pressure Failures flowchart on page 2-213.
91	**114**	ERR_Z3_NO_CONTROL /* zone 3 not able to reach setpoint */	Pressure control failure with TFSCM/TFM Collapse bladder. See Pressure Failures flowchart on page 2-213.
91	**115**	ERR_Z1_NO_CONTROL2 /* zone 1 not in tol for 15S */	Pressure control failure with TFSCM/TFM Heel bladder. See Pressure Failures flowchart on page 2-213

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**116**	ERR_Z2_NO_CONTROL2 /* zone 2 not in tol for 15S */	Pressure control failure with TFSCM/TFM Retract bladder. See Pressure Failures flowchart on page 2-213.
91	**117**	ERR_Z3_NO_CONTROL2 /* zone 3 not in tol for 15S */	Pressure control failure with TFSCM/TFM Collapse bladder. See Pressure Failures flowchart on page 2-213.
91	**118**	ERR_Z1_NOT_SAFE /* zone 1 not in safe limits */	Pressure control failure with TFSCM/TFM Heel bladder. See Pressure Failures flowchart on page 2-213.
91	**119**	ERR_Z2_NOT_SAFE /* zone 2 not in safe limits */	Pressure control failure with TFSCM/TFM Retract bladder. See Pressure Failures flowchart on page 2-213.
91	**120**	ERR_Z3_NOT_SAFE /* zone 3 not in safe limits */	Pressure control failure with TFSCM/TFM Collapse bladder. See Pressure Failures flowchart on page 2-213.
91	**130**	ERR_EE_BUSY /* eeprom still busy */	Replace TFSCM/TFM Module.
91	**131**	ERR_EE_BADADDR /* eeprom bad address */	Replace TFSCM/TFM Module.
91	**132**	ERR_EE_UNKNOWN /* eeprom error in init */	Replace TFSCM/TFM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
91	**133**	ERR_EE_DATA_VER /* eeprom data verify fail */	Replace TFSCM/TFM Module.
91	**134**	ERR_EE_S1ERROR /* eeprom data error Sector 1 */	Replace TFSCM/TFM Module.
91	**135**	ERR_EE_S2ERROR /* eeprom data error Sector 2 */	Replace TFSCM/TFM Module.
91	**136**	ERR_EE_S3ERROR /* eeprom data error Sector 3 */	Replace TFSCM/TFM Module.
91	**137**	ERR_EE_S123MISMATCH /* eeprom data mismatch ALL */	Replace TFSCM/TFM Module.
91	**138**	ERR_EEPROM_INIT /* eeprom init failure */	Replace TFSCM/TFM Module.
91	**139**	ERR_EE_TEST1 /* eeprom test error 1 */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**140**	ERR_EE_TEST2 /* eeprom test error 2 */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**141**	ERR_EE_TEST3 /* eeprom test error 3 */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**142**	ERR_EE_TEST4 /* eeprom test pass count */	Reserved. Reset bed. If code reappears, replace TFSCM/TFM.
91	**144**	ERR_SS_CODE 0x90 /* safe state error code */	Reserved. Reset bed. If code reappears, replace TTM.
91	**145**	ERR_BAD_ROM_CHKSUM 0x91 /* rom checksum failed */	Reserved. Reset bed. If code reappears, replace TTM.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**1**	ERR_RS232_OVERFLOW /* warning only */	No action required.
92	**2**	ERR_RS232_BAD_BOF /* warning only */	No action required.
92	**3**	ERR_RS232_BAD_CRC /* warning only */	No action required.
92	**4**	ERR_RS232_TIMEOUT /* warning only */	No action required.
92	**5**	ERR_RS232_BAD_MID /* warning only */	No action required.
92	**17**	ERR_SPI_OVERFLOW /* warning only */	No action required.
92	**18**	ERR_SPI_BAD_BOF /* warning only */	No action required.
92	**19**	ERR_SPI_BAD_CRC /* warning only */	No action required.
92	**20**	ERR_SPI_TIMEOUT /* warning only */	No action required.
92	**21**	ERR_SPI_BAD_MID /* warning only */	No action required.
92	**32**	ERR_5V_LO /* warning only */	No action required.
92	**33**	ERR_5V_HI /* warning only */	No action required.
92	**34**	ERR_15V_LO /* warning only */	No action required.
92	**35**	ERR_15V_HI /* warning only */	No action required.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**48**	ERR_TIMERS_NOT_RUNNING	Reset Bed. Replace PPM if problem persists.
92	**49**	ERR_TEST1 /* test 1 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**50**	ERR_TEST2 /* test 2 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**51**	ERR_TEST3 /* test 3 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**52**	ERR_TEST4 /* test 4 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**53**	ERR_TEST5 /* test 5 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**54**	ERR_TEST6 /* test 6 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**55**	ERR_TEST7 /* test 7 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**56**	ERR_TEST8 /* test 8 error code */	Reserved. Reset bed. If code reappears, replace PPM.
92	**57**	ERR_TEST9 /* test 9 error code */	Reserved. Reset bed. If code reappears, replace PPM.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**64**	ERR_BLOWER_FAIL	See Pressure Failures flowchart on page 2-213.
92	**65**	ERR_ATOD_FAIL	Replace PPM Module.
92	**66**	ERR_BLOWER_HAZARD	Replace PPM Module.
92	**67**	ERR_PV_PRS_HI /* hi press when PV is OFF */	Reserved. Reset bed. If code reappears, replace PPM.
92	**68**	ERR_PV_PRS_BAD /* out of range when PV is ON */	Reserved. Reset bed. If code reappears, replace PPM.
92	**70**	ERR_BAD_CAL_Z2 0x46 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
92	**71**	ERR_BAD_CAL_Z3 0x47 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
92	**72**	ERR_BAD_CAL_Z4 0x48 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
92	**73**	ERR_BAD_CAL_PV 0x49 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
92	**74**	ERR_BOOST_LOW_PRS 0x4A /* boost prs low during rot */	Reserved. Reset bed. If code reappears, replace TTM.
92	**84**	ERR_Z1_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PPM if problem persists.
92	**85**	ERR_Z2_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PPM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**86**	ERR_Z3_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PPM if problem persists.
92	**87**	ERR_Z4_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PPM if problem persists.
92	**88**	ERR_Z1_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PPM if problem persists.
92	**89**	ERR_Z2_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PPM if problem persists.
92	**90**	ERR_Z3_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PPM if problem persists.
92	**91**	ERR_Z4_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PPM if problem persists.
92	**92**	ERR_BAD_ZONE /* bad zone in motor state machine */	Reset Bed. Replace PPM if problem persists.
92	**93**	ERR_BAD_ZONE2 /* bad zone in no new data err */	Reset Bed. Replace PPM if problem persists.
92	**96**	ERR_Z1_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**97**	ERR_Z2_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**98**	ERR_Z3_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**99**	ERR_Z1_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PPM.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**100**	ERR_Z2_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**101**	ERR_Z3_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**102**	ERR_Z1_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**103**	ERR_Z2_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**104**	ERR_Z3_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PPM.
92	**112**	ERR_Z1_NO_CONTROL /* zone 1 not able to reach setpoint */	Reserved. Reset bed. If code reappears, replace PPM.
92	**113**	ERR_Z2_NO_CONTROL /* zone 2 not able to reach setpoint */	Reserved. Reset bed. If code reappears, replace PPM.
92	**114**	ERR_Z3_NO_CONTROL /* zone 3 not able to reach setpoint */	Reserved. Reset bed. If code reappears, replace PPM.
92	**115**	ERR_Z1_NO_CONTROL2 /* zone 1 not in tol for 15S */	Reserved. Reset bed. If code reappears, replace PPM.
92	**116**	ERR_Z2_NO_CONTROL2 /* zone 2 not in tol for 15S */	Reserved. Reset bed. If code reappears, replace PPM.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**117**	ERR_Z3_NO_CONTROL2 /* zone 3 not in tol for 15S */	Reserved. Reset bed. If code reappears, replace PPM.
92	**118**	ERR_Z1_NOT_SAFE /* zone 1 not in safe limits */	Reserved. Reset bed. If code reappears, replace PPM.
92	**119**	ERR_Z2_NOT_SAFE /* zone 2 not in safe limits */	Reserved. Reset bed. If code reappears, replace PPM.
92	**120**	ERR_Z3_NOT_SAFE /* zone 3 not in safe limits */	Reserved. Reset bed. If code reappears, replace PPM.
92	**130**	ERR_EE_BUSY /* eeprom still busy */	Replace PPM Module.
92	**131**	ERR_EE_BADADDR /* eeprom bad address */	Replace PPM Module.
92	**132**	ERR_EE_UNKNOWN /* eeprom error in init */	Replace PPM Module.
92	**133**	ERR_EE_DATA_VER /* eeprom data verify fail */	Replace PPM Module.
92	**134**	ERR_EE_S1ERROR /* eeprom data error Sector 1 */	Replace PPM Module.
92	**135**	ERR_EE_S2ERROR /* eeprom data error Sector 2 */	Replace PPM Module.
92	**136**	ERR_EE_S3ERROR /* eeprom data error Sector 3 */	Replace PPM Module.
92	**137**	ERR_EE_S123MISMATCH /* eeprom data mismatch ALL */	Replace PPM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
92	**138**	ERR_EEPROM_INIT /* eeprom init failure */	Replace PPM Module.
92	**139**	ERR_EE_TEST1 /* eeprom test error 1 */	Reserved. Reset bed. If code reappears, replace PPM.
92	**140**	ERR_EE_TEST2 /* eeprom test error 2 */	Reserved. Reset bed. If code reappears, replace PPM.
92	**141**	ERR_EE_TEST3 /* eeprom test error 3 */	Reserved. Reset bed. If code reappears, replace PPM.
92	**142**	ERR_EE_TEST4 /* eeprom test pass count */	Reserved. Reset bed. If code reappears, replace PPM.
92	**144**	ERR_SS_CODE 0x90 /* safe state error code */	Reserved. Reset bed. If code reappears, replace TTM.
92	**145**	ERR_BAD_ROM_CHKSUM 0x91 /* rom checksum failed */	Reserved. Reset bed. If code reappears, replace TTM.
93	**1**	ERR_RS232_OVERFLOW /* warning only */	No action required.
93	**2**	ERR_RS232_BAD_BOF /* warning only */	No action required.
93	**3**	ERR_RS232_BAD_CRC /* warning only */	No action required.
93	**4**	ERR_RS232_TIMEOUT /* warning only */	No action required.
93	**5**	ERR_RS232_BAD_MID /* warning only */	No action required.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**17**	ERR_SPI_OVERFLOW /* warning only */	No action required.
93	**18**	ERR_SPI_BAD_BOF /* warning only */	No action required.
93	**19**	ERR_SPI_BAD_CRC /* warning only */	No action required.
93	**20**	ERR_SPI_TIMEOUT /* warning only */	No action required.
93	**21**	ERR_SPI_BAD_MID /* warning only */	No action required.
93	**32**	ERR_5V_LO /* warning only */	No action required.
93	**33**	ERR_5V_HI /* warning only */	No action required.
93	**34**	ERR_15V_LO /* warning only */	No action required.
93	**35**	ERR_15V_HI /* warning only */	No action required.
93	**48**	ERR_TIMERS_NOT_RUNNING	Reset Bed. Replace PRM if problem persists.
93	**49**	ERR_TEST1 /* test 1 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**50**	ERR_TEST2 /* test 2 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**51**	ERR_TEST3 /* test 3 error code */	Reserved. Reset bed. If code reappears, replace PRM.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**52**	ERR_TEST4 /* test 4 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**53**	ERR_TEST5 /* test 5 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**54**	ERR_TEST6 /* test 6 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**55**	ERR_TEST7 /* test 7 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**56**	ERR_TEST8 /* test 8 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**57**	ERR_TEST9 /* test 9 error code */	Reserved. Reset bed. If code reappears, replace PRM.
93	**64**	ERR_BLOWER_FAIL	See Pressure Failures flowchart on page 2-213.
93	**65**	ERR_ATOD_FAIL	Replace PRM Module.
93	**66**	ERR_BLOWER_HAZARD	Replace PRM Module.
93	**67**	ERR_PV_PRS_HI /* hi press when PV is OFF */	Reserved. Reset bed. If code reappears, replace PRM.
93	**68**	ERR_PV_PRS_BAD /* out of range when PV is ON */	Reserved. Reset bed. If code reappears, replace PRM.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**69**	ERR_BAD_CAL_Z1 0x45 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
93	**70**	ERR_BAD_CAL_Z2 0x46 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
93	**71**	ERR_BAD_CAL_Z3 0x47 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
93	**72**	ERR_BAD_CAL_Z4 0x48 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
93	**73**	ERR_BAD_CAL_PV 0x49 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
93	**74**	ERR_BOOST_LOW_PRS 0x4A /* boost prs low during rot */	Reserved. Reset bed. If code reappears, replace TTM.
93	**84**	ERR_Z1_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PRM if problem persists.
93	**85**	ERR_Z2_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PRM if problem persists.
93	**86**	ERR_Z3_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PRM if problem persists.
93	**87**	ERR_Z4_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PRM if problem persists.
93	**88**	ERR_Z1_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PRM if problem persists.
93	**89**	ERR_Z2_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PRM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**90**	ERR_Z3_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PRM if problem persists.
93	**91**	ERR_Z4_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PRM if problem persists.
93	**92**	ERR_BAD_ZONE /* bad zone in motor state machine */	Reset Bed. Replace PRM if problem persists.
93	**93**	ERR_BAD_ZONE2 /* bad zone in no new data err */	Reset Bed. Replace PRM if problem persists.
93	**96**	ERR_Z1_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**97**	ERR_Z2_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**98**	ERR_Z3_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**99**	ERR_Z1_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**100**	ERR_Z2_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**101**	ERR_Z3_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**102**	ERR_Z1_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PRM.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**103**	ERR_Z2_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**104**	ERR_Z3_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PRM.
93	**112**	ERR_Z1_NO_CONTROL /* zone 1 not able to reach setpoint */	Pressure control failure with PRM Left Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**113**	ERR_Z2_NO_CONTROL /* zone 2 not able to reach setpoint */	Pressure control failure with PRM Right Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**114**	ERR_Z3_NO_CONTROL /* zone 3 not able to reach setpoint */	Reserved. Reset bed. If code reappears, replace PRM.
93	**115**	ERR_Z1_NO_CONTROL2 /* zone 1 not in tol for 15S */	Pressure control failure with PRM Left Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**116**	ERR_Z2_NO_CONTROL2 /* zone 2 not in tol for 15S */	Pressure control failure with PRM Right Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**117**	ERR_Z3_NO_CONTROL2 /* zone 3 not in tol for 15S */	Reserved. Reset bed. If code reappears, replace PRM.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**118**	ERR_Z1_NOT_SAFE /* zone 1 not in safe limits */	Pressure control failure with PRM Left Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**119**	ERR_Z2_NOT_SAFE /* zone 2 not in safe limits */	Pressure control failure with PRM Right Boost bladder. See Pressure Failures flowchart on page 2-213.
93	**120**	ERR_Z3_NOT_SAFE /* zone 3 not in safe limits */	Reserved. Reset bed. If code reappears, replace PRM.
93	**130**	ERR_EE_BUSY /* eeprom still busy */	Replace PRM Module.
93	**131**	ERR_EE_BADADDR /* eeprom bad address */	Replace PRM Module.
93	**132**	ERR_EE_UNKNOWN /* eeprom error in init */	Replace PRM Module.
93	**133**	ERR_EE_DATA_VER /* eeprom data verify fail */	Replace PRM Module.
93	**134**	ERR_EE_S1ERROR /* eeprom data error Sector 1 */	Replace PRM Module.
93	**135**	ERR_EE_S2ERROR /* eeprom data error Sector 2 */	Replace PRM Module.
93	**136**	ERR_EE_S3ERROR /* eeprom data error Sector 3 */	Replace PRM Module.
93	**137**	ERR_EE_S123MISMATCH /* eeprom data mismatch ALL */	Replace PRM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
93	**138**	ERR_EEPROM_INIT /* eeprom init failure */	Replace PRM Module.
93	**139**	ERR_EE_TEST1 /* eeprom test error 1 */	Reserved. Reset bed. If code reappears, replace PRM.
93	**140**	ERR_EE_TEST2 /* eeprom test error 2 */	Reserved. Reset bed. If code reappears, replace PRM.
93	**141**	ERR_EE_TEST3 /* eeprom test error 3 */	Reserved. Reset bed. If code reappears, replace PRM.
93	**142**	ERR_EE_TEST4 /* eeprom test pass count */	Reserved. Reset bed. If code reappears, replace PRM.
93	**144**	ERR_SS_CODE 0x90 /* safe state error code */	Reserved. Reset bed. If code reappears, replace TTM.
93	**145**	ERR_BAD_ROM_CHKSUM 0x91 /* rom checksum failed */	Reserved. Reset bed. If code reappears, replace TTM.
94	**1**	ERR_RS232_OVERFLOW /* warning only */	No action required.
94	**2**	ERR_RS232_BAD_BOF /* warning only */	No action required.
94	**3**	ERR_RS232_BAD_CRC /* warning only */	No action required.
94	**4**	ERR_RS232_TIMEOUT /* warning only */	No action required.
94	**5**	ERR_RS232_BAD_MID /* warning only */	No action required.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**17**	ERR_SPI_OVERFLOW /* warning only */	No action required.
94	**18**	ERR_SPI_BAD_BOF /* warning only */	No action required.
94	**19**	ERR_SPI_BAD_CRC /* warning only */	No action required.
94	**20**	ERR_SPI_TIMEOUT /* warning only */	No action required.
94	**21**	ERR_SPI_BAD_MID /* warning only */	No action required.
94	**32**	ERR_5V_LO /* warning only */	No action required.
94	**33**	ERR_5V_HI /* warning only */	No action required.
94	**34**	ERR_15V_LO /* warning only */	No action required.
94	**35**	ERR_15V_HI /* warning only */	No action required.
94	**48**	ERR_TIMERS_NOT_RUNNING	Reset Bed. Replace PBM if problem persists.
94	**49**	ERR_TEST1 /* test 1 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**50**	ERR_TEST2 /* test 2 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**51**	ERR_TEST3 /* test 3 error code */	Reserved. Reset bed. If code reappears, replace PBM.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**52**	ERR_TEST4 /* test 4 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**53**	ERR_TEST5 /* test 5 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**54**	ERR_TEST6 /* test 6 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**55**	ERR_TEST7 /* test 7 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**56**	ERR_TEST8 /* test 8 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**57**	ERR_TEST9 /* test 9 error code */	Reserved. Reset bed. If code reappears, replace PBM.
94	**64**	ERR_BLOWER_FAIL	See Pressure Failures flowchart on page 2-213.
94	**65**	ERR_ATOD_FAIL	Replace PBM Module.
94	**66**	ERR_BLOWER_HAZARD	Replace PBM Module.
94	**67**	ERR_PV_PRS_HI /* hi press when PV is OFF */	Reserved. Reset bed. If code reappears, replace PBM.
94	**68**	ERR_PV_PRS_BAD /* out of range when PV is ON */	Reserved. Reset bed. If code reappears, replace PBM.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**69**	ERR_BAD_CAL_Z1 0x45 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
94	**70**	ERR_BAD_CAL_Z2 0x46 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
94	**71**	ERR_BAD_CAL_Z3 0x47 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
94	**72**	ERR_BAD_CAL_Z4 0x48 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
94	**73**	ERR_BAD_CAL_PV 0x49 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
94	**74**	ERR_BOOST_LOW_PRS 0x4A /* boost prs low during rot */	Reserved. Reset bed. If code reappears, replace TTM.
94	**84**	ERR_Z1_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PBM if problem persists.
94	**85**	ERR_Z2_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PBM if problem persists.
94	**86**	ERR_Z3_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PBM if problem persists.
94	**87**	ERR_Z4_BAD_STATE /* bad state in state machine */	Reset Bed. Replace PBM if problem persists.
94	**88**	ERR_Z1_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PBM if problem persists.
94	**89**	ERR_Z2_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PBM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**90**	ERR_Z3_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PBM if problem persists.
94	**91**	ERR_Z4_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace PBM if problem persists.
94	**92**	ERR_BAD_ZONE /* bad zone in motor state machine */	Reset Bed. Replace PBM if problem persists.
94	**93**	ERR_BAD_ZONE2 /* bad zone in no new data err */	Reset Bed. Replace PBM if problem persists.
94	**96**	ERR_Z1_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**97**	ERR_Z2_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**98**	ERR_Z3_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**99**	ERR_Z1_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**100**	ERR_Z2_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**101**	ERR_Z3_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**102**	ERR_Z1_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PBM.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**103**	ERR_Z2_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**104**	ERR_Z3_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace PBM.
94	**112**	ERR_Z1_NO_CONTROL /* zone 1 not able to reach setpoint */	Pressure control failure with PBM Left Working bladder. See Pressure Failures flowchart on page 2-213.
94	**113**	ERR_Z2_NO_CONTROL /* zone 2 not able to reach setpoint */	Pressure control failure with PBM Right Working bladder. See Pressure Failures flowchart on page 2-213.
94	**114**	ERR_Z3_NO_CONTROL /* zone 3 not able to reach setpoint */	Pressure control failure with PBM Head bladder. See Pressure Failures flowchart on page 2-213.
94	**115**	ERR_Z1_NO_CONTROL2 /* zone 1 not in tol for 15S */	Pressure control failure with PBM Left Working bladder. See Pressure Failures flowchart on page 2-213.
94	**116**	ERR_Z2_NO_CONTROL2 /* zone 2 not in tol for 15S */	Pressure control failure with PBM Right Working bladder. See Pressure Failures flowchart on page 2-213.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**117**	ERR_Z3_NO_CONTROL2 /* zone 3 not in tol for 15S */	Pressure control failure with PBM Head bladder. See Pressure Failures flowchart on page 2-213.
94	**118**	ERR_Z1_NOT_SAFE /* zone 1 not in safe limits */	Pressure control failure with PBM Left Working bladder. See Pressure Failures flowchart on page 2-213.
94	**119**	ERR_Z2_NOT_SAFE /* zone 2 not in safe limits */	Pressure control failure with PBM Right Working bladder. See Pressure Failures flowchart on page 2-213.
94	**120**	ERR_Z3_NOT_SAFE /* zone 3 not in safe limits */	Pressure control failure with PBM Head bladder. See Pressure Failures flowchart on page 2-213.
94	**130**	ERR_EE_BUSY /* eeprom still busy */	Replace PBM Module.
94	**131**	ERR_EE_BADADDR /* eeprom bad address */	Replace PBM Module.
94	**132**	ERR_EE_UNKNOWN /* eeprom error in init */	Replace PBM Module.
94	**133**	ERR_EE_DATA_VER /* eeprom data verify fail */	Replace PBM Module.
94	**134**	ERR_EE_S1ERROR /* eeprom data error Sector 1 */	Replace PBM Module.
94	**135**	ERR_EE_S2ERROR /* eeprom data error Sector 2 */	Replace PBM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
94	**136**	ERR_EE_S3ERROR /* eeprom data error Sector 3 */	Replace PBM Module.
94	**137**	ERR_EE_S123MISMATCH /* eeprom data mismatch ALL */	Replace PBM Module.
94	**138**	ERR_EEPROM_INIT /* eeprom init failure */	Replace PBM Module.
94	**139**	ERR_EE_TEST1 /* eeprom test error 1 */	Reserved. Reset bed. If code reappears, replace PBM.
94	**140**	ERR_EE_TEST2 /* eeprom test error 2 */	Reserved. Reset bed. If code reappears, replace PBM.
94	**141**	ERR_EE_TEST3 /* eeprom test error 3 */	Reserved. Reset bed. If code reappears, replace PBM.
94	**142**	ERR_EE_TEST4 /* eeprom test pass count */	Reserved. Reset bed. If code reappears, replace PBM.
94	**144**	ERR_SS_CODE 0x90 /* safe state error code */	Reserved. Reset bed. If code reappears, replace TTM.
94	**145**	ERR_BAD_ROM_CHKSUM 0x91 /* rom checksum failed */	Reserved. Reset bed. If code reappears, replace TTM.
95	**1**	ERR_RS232_OVERFLOW /* warning only */	No action required.
95	**2**	ERR_RS232_BAD_BOF /* warning only */	No action required.
95	**3**	ERR_RS232_BAD_CRC /* warning only */	No action required.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**4**	ERR_RS232_TIMEOUT /* warning only */	No action required.
95	**5**	ERR_RS232_BAD_MID /* warning only */	No action required.
95	**17**	ERR_SPI_OVERFLOW /* warning only */	No action required.
95	**18**	ERR_SPI_BAD_BOF /* warning only */	No action required.
95	**19**	ERR_SPI_BAD_CRC /* warning only */	No action required.
95	**20**	ERR_SPI_TIMEOUT /* warning only */	No action required.
95	**21**	ERR_SPI_BAD_MID /* warning only */	No action required.
95	**32**	ERR_5V_LO /* warning only */	No action required.
95	**33**	ERR_5V_HI /* warning only */	No action required.
95	**34**	ERR_15V_LO /* warning only */	No action required.
95	**35**	ERR_15V_HI /* warning only */	No action required.
95	**48**	ERR_TIMERS_NOT_RUNNING	Reset Bed. Replace TTM if problem persists.
95	**49**	ERR_TEST1 /* test 1 error code */	Reserved. Reset bed. If code reappears, replace TTM.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**50**	ERR_TEST2 /* test 2 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**51**	ERR_TEST3 /* test 3 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**52**	ERR_TEST4 /* test 4 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**53**	ERR_TEST5 /* test 5 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**54**	ERR_TEST6 /* test 6 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**55**	ERR_TEST7 /* test 7 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**56**	ERR_TEST8 /* test 8 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**57**	ERR_TEST9 /* test 9 error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**64**	ERR_BLOWER_FAIL	See Pressure Failures flowchart on page 2-213.
95	**65**	ERR_ATOD_FAIL	Replace TTM Module.
95	**66**	ERR_BLOWER_HAZARD	Replace TTM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**67**	ERR_PV_PRS_HI /* hi press when PV is OFF */	Reserved. Reset bed. If code reappears, replace TTM.
95	**68**	ERR_PV_PRS_BAD /* out of range when PV is ON */	Reserved. Reset bed. If code reappears, replace TTM.
95	**69**	ERR_BAD_CAL_Z1 0x45 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
95	**70**	ERR_BAD_CAL_Z2 0x46 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
95	**71**	ERR_BAD_CAL_Z3 0x47 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
95	**72**	ERR_BAD_CAL_Z4 0x48 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
95	**73**	ERR_BAD_CAL_PV 0x49 /* bad calibration data */	Reserved. Reset bed. If code reappears, replace TTM.
95	**74**	ERR_BOOST_LOW_PRS 0x4A /* boost prs low during rot */	Reserved. Reset bed. If code reappears, replace TTM.
95	**84**	ERR_Z1_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TTM if problem persists.
95	**85**	ERR_Z2_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TTM if problem persists.
95	**86**	ERR_Z3_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TTM if problem persists.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**87**	ERR_Z4_BAD_STATE /* bad state in state machine */	Reset Bed. Replace TTM if problem persists.
95	**88**	ERR_Z1_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TTM if problem persists.
95	**89**	ERR_Z2_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TTM if problem persists.
95	**90**	ERR_Z3_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TTM if problem persists.
95	**91**	ERR_Z4_NO_NEW_DATA /* timeout waiting for new data */	Reset Bed. Replace TTM if problem persists.
95	**92**	ERR_BAD_ZONE /* bad zone in motor state machine */	Reset Bed. Replace TTM if problem persists.
95	**93**	ERR_BAD_ZONE2 /* bad zone in no new data err */	Reset Bed. Replace TTM if problem persists.
95	**96**	ERR_Z1_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**97**	ERR_Z2_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**98**	ERR_Z3_LEAK /* zone leak during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**99**	ERR_Z1_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**100**	ERR_Z2_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TTM.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**101**	ERR_Z3_NO_PRESS /* zone not up to pressure during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**102**	ERR_Z1_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**103**	ERR_Z2_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**104**	ERR_Z3_PRS_CTRL_FAIL /* zone failed prs control during leak test */	Reserved. Reset bed. If code reappears, replace TTM.
95	**112**	ERR_Z1_NO_CONTROL /* zone 1 not able to reach setpoint */	Pressure control failure with TTM Chest bladder. See Pressure Failures flowchart on page 2-213.
95	**113**	ERR_Z2_NO_CONTROL /* zone 2 not able to reach setpoint */	Pressure control failure with TTM Seat bladder. See Pressure Failures flowchart on page 2-213.
95	**114**	ERR_Z3_NO_CONTROL /* zone 3 not able to reach setpoint */	Pressure control failure with TTM Thigh bladder. See Pressure Failures flowchart on page 2-213.
95	**115**	ERR_Z1_NO_CONTROL2 /* zone 1 not in tol for 15S */	Pressure control failure with TTM Chest bladder. See Pressure Failures flowchart on page 2-213.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**116**	ERR_Z2_NO_CONTROL2 /* zone 2 not in tol for 15S */	Pressure control failure with TTM Seat bladder. See Pressure Failures flowchart on page 2-213.
95	**117**	ERR_Z3_NO_CONTROL2 /* zone 3 not in tol for 15S */	Pressure control failure with TTM Thigh bladder. See Pressure Failures flowchart on page 2-213.
95	**118**	ERR_Z1_NOT_SAFE /* zone 1 not in safe limits */	Pressure control failure with TTM Chest bladder. See Pressure Failures flowchart on page 2-213.
95	**119**	ERR_Z2_NOT_SAFE /* zone 2 not in safe limits */	Pressure control failure with TTM Seat bladder. See Pressure Failures flowchart on page 2-213.
95	**120**	ERR_Z3_NOT_SAFE /* zone 3 not in safe limits */	Pressure control failure with TTM Thigh bladder. See Pressure Failures flowchart on page 2-213.
95	**130**	ERR_EE_BUSY /* eeprom still busy */	Replace TTM Module.
95	**131**	ERR_EE_BADADDR /* eeprom bad address */	Replace TTM Module.
95	**132**	ERR_EE_UNKNOWN /* eeprom error in init */	Replace TTM Module.
95	**133**	ERR_EE_DATA_VER /* eeprom data verify fail */	Replace TTM Module.
95	**134**	ERR_EE_S1ERROR /* eeprom data error Sector 1 */	Replace TTM Module.

GCI Module ID	GCI Error Code	Description	Corrective Action
95	**135**	ERR_EE_S2ERROR /* eeprom data error Sector 2 */	Replace TTM Module.
95	**136**	ERR_EE_S3ERROR /* eeprom data error Sector 3 */	Replace TTM Module.
95	**137**	ERR_EE_S123MISMATCH /* eeprom data mismatch ALL */	Replace TTM Module.
95	**138**	ERR_EEPROM_INIT /* eeprom init failure */	Replace TTM Module.
95	**139**	ERR_EE_TEST1 /* eeprom test error 1 */	Reserved. Reset bed. If code reappears, replace TTM.
95	**140**	ERR_EE_TEST2 /* eeprom test error 2 */	Reserved. Reset bed. If code reappears, replace TTM.
95	**141**	ERR_EE_TEST3 /* eeprom test error 3 */	Reserved. Reset bed. If code reappears, replace TTM.
95	**142**	ERR_EE_TEST4 /* eeprom test pass count */	Reserved. Reset bed. If code reappears, replace TTM.
95	**144**	ERR_SS_CODE 0x90 /* safe state error code */	Reserved. Reset bed. If code reappears, replace TTM.
95	**145**	ERR_BAD_ROM_CHKSUM 0x91 /* rom checksum failed */	Reserved. Reset bed. If code reappears, replace TTM.

For a list of fault codes for the NAWI Class IIII scale (European version), refer to table 2-6 on page 2-100. The fault codes listed in table 2-6 on page 2-100 are ones that differ from the fault codes listed in table 2-3 on page 2-22. If a fault code for the NAWI Class IIII scale (European version) is **not** listed in table 2-6 on page 2-100, refer to table 2-3 on page 2-22, and change the GCI Control Code ID to **51.**

Table 2-6. Fault Code Descriptions for the NAWI Class IIII Scale (European Version)

GCI Module ID	GCI Error Code	Description	Corrective Action
51	33	**Invalid value passed to function**—Trying to read A/D value for nonexistent beam. This indicates corruption of variables in RAM.	Reset the scale. If error is repeatable, replace scale board.
51	35	**A/D value out of range**—Possible causes are too much weight on section of bed, beam failure, board failure, or no weight on beam.	Use diagnostics to read A/D values, and determine which beam is generating the invalid reading.
51	36	**Hit negative limit for total weight**—Possible causes are bed not zeroed properly, EPROM corruption, or beam failure.	Look for additional error codes in the GCI Service required field. Check A/D readings on the GCI service screen. Attempt to calibrate the bed.
51	37	**Hit max limit for total weight**—Scale cannot calculate the weight because there is more than 204 kg on the bed, the scale was not zeroed, or there is an open beam.	Ensure that the load on the bed is less than 204 kg, zero the scale, and inspect for an open beam.
51	44	**Default executed in case statement**—Indicates memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	45	**Calibration switch not enabled**—The Zero calibration command needs the calibration mode to be enabled.	Enable the Calibration mode by pressing the Calibration switch on the scale board for longer than 10 seconds.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**46**	**SAVE_PULMONARY_MODULE_ WEIGHT, error writing to EPROM**	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**47**	**GET_PULMONARY_MODULE_WEIGHT, confirm failed**—The value was not the same in at least two of the three locations of EPROM.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**49**	**GET_PULMONARY_MODULE_WEIGHT, read timeout**—EPROM read failure.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**55**	**SAVE_DISPLAYED_WEIGHT**—Error writing to EPROM.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**63**	**GET_DISPLAYED_WEIGHT could not confirm**—The value was not the same in at least two of the three locations of EPROM.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**71**	**Attempted UNDO TARE with bed exit armed**— UNDO TARE command is not allowed if bed exit detection is enabled.	Disable the bed exit detection feature.
51	**101**	**Invalid state passed to PED state machine**—Indicates memory corruption.	If error is repeatable, replace the scale board.
51	**107**	**Timeout response A/D not sampling**—This causes an automatic reset of the scale board.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**118**	**Gravity constants limits wrong**—A value outside of 9.59999 to 9.999999 has been entered.	Verify that the proper value is entered.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**119**	**save_zero_point A/D data out of range**	Monitor A/D readings in service screen, look for abnormal readings. Run diagnostic self test to further diagnose the problem.
51	**120**	**save_zero_point error saving zero point data**—Error writing to EPROM.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**140**	**Error saving tare, out of range**—The bed can be tared with following limits: total_tare—8 kg to 204 kg (sum of following values) tare_value—20 kg to 205 kg (weight tared) preset_value1—99 kg to 99 kg (weight auto compensated) preset_value2—10 kg to 10 kg (add-on module weight) Attempts to tare with weight outside these limits will generate this error.	Ensure that the tare values are within the specified limits.
51	**143**	**Error saving undo tare out of range**—Indicates variable corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**171**	**Check_beam_weight_limit right foot over max load limit**	Center the patient on the bed. Check for other error codes on the GCI. Check A/D readings on the GCI. If error is repeatable, replace the scale board.
51	**172**	**Check_beam_weight_limit left foot over max load limit**	Center the patient on the bed. Check for other error codes on the GCI. Check A/D readings on the GCI. If error is repeatable, replace the scale board.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**173**	**Check_beam_weight_limit left head over max load limit**	Center the patient on the bed. Check for other error codes on the GCI. Check A/D readings on the GCI. If error is repeatable, replace the scale board.
51	**174**	**Check_beam_weight_limit right head over max load limit**	Center the patient on the bed. Check for other error codes on the GCI. Check A/D readings on the GCI. If error is repeatable, replace the scale board.
51	**177**	**Error saving coefficients**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**178**	**Error reading coefficients**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**179**	**Error saving gravity constants**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**180**	**Error reading gravity constants**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**181**	**Error saving undo tare**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**182**	**Error reading undo tare**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**183**	**Error saving tare**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**184**	**Error reading tare**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**185**	**Error saving pulm module weight**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**186**	**Error saving bed exit**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**187**	**Error saving/clear error log to EPROM**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**188**	**Error getting coeff from EPROM**—EPROM failure or memory corruption.	Check for other error codes on the GCI. Recalibrate the scale. If error is repeatable, replace the scale board.
51	**189**	**Error getting zero point EPROM**—EPROM failure or corruption.	Check for other error codes on the GCI. Zero the scale. If error is repeatable, replace the scale board.
51	**190**	**Error saving zero point**—EPROM failure or corruption.	Check for other error codes on the GCI. Rezero the scale. If error is repeatable, replace the scale board.
51	**191**	**Error reading zero point**—EPROM failure or corruption.	Check for other error codes on the GCI. Rezero the scale. If error is repeatable, replace the scale board.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**193**	**Error calculated weight is out of range**	Ensure the weight is between -204 kg and 204 kg.
51	**195**	**Error saving zero point**—Zero point is outside of 100 to 32767, or failure to write to EPROM.	Check for other error codes on the GCI. Check range by observing zero range on the service screen. Reset the scale. If error is repeatable, replace the scale board.
51	**196**	**Error reading zero point**—EPROM failure or data corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**197**	**Error saving undo tare**—EPROM failure.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**198**	**Error saving tare weight**—EPROM failure.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**199**	**Error getting tare weight**—EPROM failure or RAM corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**202**	**Error getting tare**—EPROM failure or RAM corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**203**	**Process_gravity_const_error saving**—EPROM failure.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**204**	**Process_gravity_const error getting**—EPROM failure or RAM corruption.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.

GCI Module ID	GCI Error Code	Description	Corrective Action
51	**205**	**Check-sum mismatch, RAM variables**—RAM failure.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**206**	**Gravity constant out of range**	Ensure values are between 9.599999 to 9.999999.
51	**207**	**ACR A/D register mismatch**—Values of critical registers of the A/D converter are different than settings.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.
51	**209**	**SETUP A/D register mismatch**—Values of critical registers of the A/D converter are different than settings.	Check for other error codes on the GCI. Reset the scale. If error is repeatable, replace the scale board.

Table 2-7. Graphical Caregiver Interface (GCI)® Control Error Codes

GCI Module ID	GCI Error Code	Description	Corrective Action
42	21	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	22	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	23	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	24	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	25	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	26	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.

GCI Module ID	GCI Error Code	Description	Corrective Action
42	27	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	28	**Value range/reset warning**.	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	29	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.
42	30	**Value range/reset warning**	No action is required. These warnings are logged for testing purposes only and do **not** impact operation of the Graphical Caregiver Interface (GCI)® Control.

Table 2-8. Diagnostic Commands (P1900D Model)

Prefix	Code	Description
90	**99**	Display software revision for TFM and modules. **90 99 Module id, rev00, rev01, rev02, rev03, 0** Module id is 0-TFM neuron, 1-TFM 8051, 2-PPM, 3-PRM, 4-PBM, 5-TTM
90	**158**	Resets all pulmonary modules. The command is not echoed on the GCI screen. After the command is sent, press **ENTER** on the Graphical Caregiver Interface (GCI)® Control to enter another diagnostic command.
90	**159**	Initialize new board.
90	**185**	Diagnostic function for the scale. Response from scale weight adjusted for modules. Do not send from the Graphical Caregiver Interface (GCI)® Control.
90	**202**	Long valve cycle test; then leak test; 202, leak test id (1,2,3). **90 202 leak test id, 0, 0, 0, 0, 0**
90	**203**	Short valve cycle test then leak test - 203, leak test id (1, 2, 3). **90 203 leak test id, 0, 0, 0, 0, 0**
90	**211**	Read non-permanent valve cycles from modules. Use 212-216 to display values. **90 211 211, 0, 0, 0, 0, 0**
90	**212**	Display TFM valve counters. Send a 218 or 211 first to read values from the modules. **90 212 212, zone id, w, x, y, z** Where count = w*256^3+ x*256^2 + y*256 + z
90	**213**	Display PV valve counters. Send a 218 or 211 first to read values from the modules. **90 213 213, zone id, w, x, y, z** Where count = w*256^3+ x*256^2 + y*256 + z
90	**214**	Display PRM valve counters. Send a 218 or 211 first to read values from the modules. **90 214 214, zone id, w, x, y, z** Where count = w*256^3+ x*256^2 + y*256 + z

Prefix	Code	Description
90	**215**	Display PBM valve counters. Send a 218 or 211 first to read values from the modules. **90 215 215, zone id, w, x, y, z** Where count = w*256^3+ x*256^2 + y*256 + z
90	**216**	Display TTM valve counters. Send a 218 or 211 first to read values from the modules. **90 216 216, zone id, w, x, y, z** Where count = w*256^3+ x*256^2 + y*256 + z
90	**218**	Read vacuum permanent valve cycle counts. Use 212-216 to display values. **90 218 218, 0, 0, 0, 0, 0**
90	**219**	Clear leak test failure counts and error codes stored in FRAM. **90 219 219, 0, 0, 0, 0, 0**
90	**220**	Clear permanent valve counters. **90 220 220, 0, 0, 0, 0, 0**
90	**221**	BYPASS mode for simulator, DO nothing mode. **90 221 221, 0, 0, 0, 0, 0**
90	**222**	Clear permanent cycle counters. **90 222 222, 0, 0, 0, 0, 0**
90	**223**	Time and date when cycle/leak test started. Date when cycle test counters cleared (219) **90 223 1, year (high byte), year (low byte), month, day, hour** Date when permanent valve counters cleared (220) **90 223 2, year (high byte), year (low byte), month, day, hour** Leak test counter. **90 223 3, leak test count (high byte), leak test count(low byte), month, day, hour**
90	**224**	Toggles the manifold pressure. **90 224, manifold pressure,0,0,0,0** Where manifold pressure = 3,10,20, or 25 inches h2o.
90	**226**	Cycle test only. **90 226 226,0,0,0,0**

Prefix	Code	Description
90	**227**	Shut valves and force idle mode. **90 227 227,0,0,0,0**
90	**240**	Read module's eeprom leak test failure counts. Display **90 240 240,0,0,0,0,0**
90	**241**	Display module leak test error counts Zone id, TFM, 0, PRM, PBM, TTM **90 241 1,TFM,0,PRM,PBM,TTM Zone 1 *Note- A value > 240 is not valid.** **90 241 2,TFM,0,PRM,PBM,TTM Zone 2** **90 241 3,TFM,0,PRM,PBM,TTM Zone 3**
90	**242**	Display module leak test low pressure failure counts error counts **90 242 1,TFM,0,PRM,PBM,TTM Zone 1 *Note- A value > 240 is not valid.** **90 242 2,TFM,0,PRM,PBM,TTM Zone 2** **90 242 3,TFM,0,PRM,PBM,TTM Zone 3**
90	**243**	Display module leak test pressure control failure counts error counts. **90 243 1,TFM,0,PRM,PBM,TTM Zone 1 *Note- A value > 240 is not valid.** **90 243 2,TFM,0,PRM,PBM,TTM Zone 2** **90 243 3,TFM,0,PRM,PBM,TTM Zone 3**
90	**244**	Display module leak test pressure control communication error counts. **90 244 244,TFM,PPM,PRM,PBM,TTM** Communications are checked during the cycle/leak test, these counts indicate a quality factor of less than 124 during the cycle/leak test.
90	**245**	Display communication quality factor: 128 is the best; 0 is the lowest. **90 245 TFM, PPM, PRM, PBM, TTM Updated every 2 minutes.**
90	**246**	Display last 32 errors (**Service required** alarms) stored in FRAM. Cleared by command 219. **90 246 count, 0, error code1, error code2, error code3, error code4** Count increments every time the command is sent and is the error code for the first position displayed - error code1.

Prefix	Code	Description
90	**247**	Display PV solenoid valve counters. Enter the command twice. The first time reads the data from the PV valve. The second time displays the data. PV must be installed in the bed. **90 247 247, 0, w, x, y, z** Where count = w*256^3+x*256^2 + y*256 + z

2.1 Patient Air Surface Module with Foot Therapy—Switch/Stepper Failures

1. Do any of the following Graphical Caregiver Interface (GCI)® Control error codes appear:

- 80—17 through 31 Treatment Foot Surface Control Module (TFSCM)
- 80—33 through 47 Treatment Surface Control module (TSCM)
- 80—161 through 164 (TFSCM)
- 80—165 through 168 (TSCM)

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

2. Replace the indicated module (refer to procedure 4.60). Perform the Air System Function Check. See “Air System Function Check” on page 2-16. This solves the problem.

Yes **No**
↓ → For assistance call Hill-Rom Technical Support at (800) 445-3720.

3. Go to “Final Actions” on page 2-18.

2.2 Patient Air Surface Module with Foot Therapy—Pressure Failures

1. Do any of the following Graphical Caregiver Interface (GCI)® Control error codes appear (see table 2-9 on page 2-114):

   Yes No
   ↓ → Go to “Final Actions” on page 2-18.

- 80—113—through 116 (TFSCM)
- 80—129—through 132 (TSCM)

Table 2-9. Zone Valve Identification

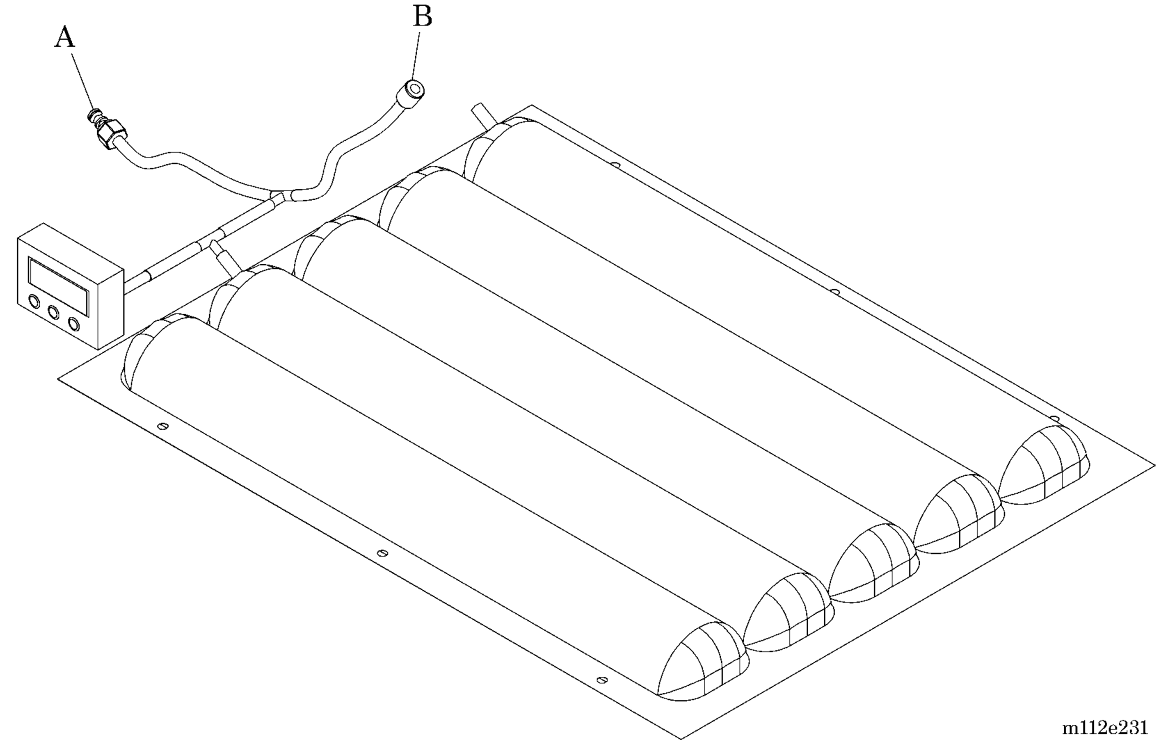
Zone	TFSCM	TSCM
001	Collapse (Orange)	Head (White)
002	Heel (Violet)	Thigh (Black)
003	Retract (Gray)	Seat (Red)

2. Ensure that all six mattress hoses are properly connected to the modules by pushing each connector toward its module. A click is heard.

   Yes No
   ↓ → Go to “Air System Function Check” on page 2-16.

3. Perform the following:
   a. Disconnect the indicated mattress zone from the air manifold.
   b. Connect the male end (A) of the tester to the mattress and the female end (B) to the air manifold (see figure 2-1 on page 2-115).

Figure 2-1. Leak Test Kit (SA9076)



c. Ensure that the head section is below 30° and the foot section is flat and completely extended.

d. Reset the bed, and allow the mattress and the test cushion to pressurize for 3 minutes. For mattress cushion pressures, refer to the appropriate table:

- On a **treatment** model **before** serial number C143AM2330, refer to table 2-10 on page 2-116.
- On a **treatment** model **after** serial number C143AM2330 or on a bed with Revision 22 software on the TFSCM, refer to table 2-11 on page 2-116.
- On a **pulmonary** model when using a pressure meter or manometer, refer to table 2-12 on page 2-117.

Table 2-10. Mattress Cushion Pressures (Treatment Models before Serial Number C143AM2330)

Zone	Pressure (" H_2O)	Pressure (mm Hg)
Head (White)	7.0 ± 2.0	13.1 ± 3.7
Seat (Red)	5.0 ± 2.0	9.3 ± 3.7
Thigh (Black)	8.8 ± 2.0	16.4 ± 3.7
Collapse (Orange)	3.0 ± 1.0	5.6 ± 1.9
Retract (Gray)	3.0 ± 1.0	5.6 ± 1.9
Heel (Violet)	3.0 ± 1.0	5.6 ± 1.9

Table 2-11. Mattress Cushion Pressures (Treatment Models after Serial Number C143AM2330 or Beds with Revision 22 Software on the TFSCM)

Zone	Pressure (" H_2O)	Pressure (mm Hg)
Head (White)	10.0 ± 2.0	18.6 ± 3.7
Seat (Red)	13.0 ± 2.0	24.2 ± 3.7
Thigh (Black)	10.0 ± 2.0	18.6 ± 3.7
Collapse (Orange)	3.0 ± 1.0	5.6 ± 1.9
Retract (Gray)	3.0 ± 1.0	5.6 ± 1.9
Heel (Violet)	3.0 ± 1.0	5.6 ± 1.9

Table 2-12. Mattress Cushion Pressures (Pulmonary Models when Using a Pressure Meter or Manometer)

Zone	Pressure (" H_2O)	Pressure (mm Hg)
Head (White)	7.0 ± 2.0	13.1 ± 3.7
Seat (Red)	5.0 ± 2.0	9.3 ± 3.7
Thigh (Black)	8.8 ± 2.0	16.4 ± 3.7
Collapse (Orange)	3.0 ± 1.0	5.6 ± 1.9
Retract (Gray)	3.0 ± 1.0	5.6 ± 1.9
Heel (Violet)	3.0 ± 1.0	5.6 ± 1.9
Left Working (Yellow) (with Version 3.029 or lower software)	7.0 ± 2.0	13.1 ± 3.7
Left Working (Yellow) (with Version 3.031 or higher software)	10.0 ± 2.0	18.6 ± 3.7
Right Working (Green) (with Version 3.029 or lower software)	7.0 ± 2.0	13.1 ± 3.7
Right Working (Green) (with Version 3.031 or higher software)	10.0 ± 2.0	18.6 ± 3.7
Head (Clear)	5.0 ± 2.0	9.3 ± 3.7
Left Boost (Blue)	0.0 ± 1.0	0.0 ± 1.9
Right Boost (Clear)	0.0 ± 1.0	0.0 ± 1.9

e. Disconnect the male end (A) of the tester from the mattress.

f. Allow the air system to pressurize an additional 30 seconds.

g. Unplug the bed from its power source.

The test cushion pressure decreases more than 1.0" H_2O (1.9 mm Hg).

Yes **No**
↓ → Go to step 5.

4. Perform the following:

   a. Disconnect all three mattress hoses.

   b. Replace the indicated module (refer to procedure 4.60).

   c. Go to “Air System Function Check” on page 2-16.

5. Perform the following:
   a. Disconnect the female end (B) of the tester from the air manifold.
   b. Connect the male end (A) of the tester to the indicated mattress zone again.

   The indicated mattress zone has a pressure of 0" H_2O (0 mm Hg).

   Yes **No**
   ↓ → Go to step 7.

6. Replace the cushion and plumbing of the indicated zone, and go to “Air System Function Check” on page 2-16.

7. The indicated mattress zone pressure decreases more than 1.0" H_2O (1.9 mm Hg) in 2 minutes.

   Yes **No**
   ↓ → Reconnect the mattress to the module, and go to “Air System Function Check” on page 2-16.

NOTE:
The mattress zone pressure is affected by any patient movement.

8. Replace the cushion and plumbing of the indicated zone, and go to “Air System Function Check” on page 2-16.

2.3 Pulmonary Mattress Air Valve Module Troubleshooting

After making repairs to the bed, perform this procedure without a patient on the bed. If a patient cannot be removed from the bed, ensure that their is minimal movement by the patient.

1. Perform the following:
   a. At the Graphical Caregiver Interface (GCI)® Control, access the **Service Required** screen.
   b. At the **Service Required** screen, scroll to **Cushion pressure**, and press **Enter**.
   c. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

Table 2-13. Mattress Cushion Pressure Setpoints

Pressure Setpoint	Positive Tolerance	Negative Tolerance
0 to 3	+ 0.7	- 0.2
> 3 to 17	+ 1.5	- 1.2
> 17	+ 6.0	- 2.0

Each pressure value is within tolerance.

Yes **No**
↓ → Go to step 9.

2. Perform the following:
   a. At the **Cushion Pressure** screen, select **NEXT screen**, and press **Enter**.
   b. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

   Each pressure value is within tolerance.

   Yes **No**
   ↓ → Go to step 9.

3. Perform the following:
   a. At the siderail **opposite** the Graphical Caregiver Interface (GCI)® Control, use the push button controls to put the bed in Max-Inflate mode.

b. Allow the bed approximately 3 minutes to adjust pressures.

c. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

Each pressure value is within tolerance.

Yes **No**
↓ → Go to step 9.

4. Perform the following:

a. At the Graphical Caregiver Interface (GCI)® Control, select **NEXT screen**, and press **Enter**.

b. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

Each pressure value is within tolerance.

Yes **No**
↓ → Go to step 9.

5. Perform the following:

a. At the siderail **opposite** the Graphical Caregiver Interface (GCI)® Control, use the push button controls to put the bed in Normal mode.

b. Allow the bed approximately 3 minutes to adjust pressures.

c. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

Each pressure value is within tolerance.

Yes **No**
↓ → Go to step 9.

6. Perform the following:

a. At the Graphical Caregiver Interface (GCI)® Control, select **NEXT screen**, and press **Enter**.

b. Compare the actual pressure values to the set pressure values for each zone (see table 2-13 on page 2-119).

Each pressure value is within tolerance.

Yes **No**
↓ → Go to step 9.

7. All pressures stay within tolerance.

Yes **No**
↓ → Go to step 9.

8. Perform the following:
   a. At the Graphical Caregiver Interface (GCI)® Control, select **HOME**, and press **Enter**.
   b. Go to step 11.

9. At the faulty zone, switch the mattress connection to a properly functioning zone. The error moves to the new valve zone.

   Yes **No**
   ↓ → Replace the valve module (refer to procedure 4.61). If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 10.

10. The mattress bladder is leaking. Replace the affected mattress bladder. This solves the problem.

    Yes **No**
    ↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

11. Go to “Final Actions” on page 2-18.

2.4 Patient Air Surface Module with Foot Therapy—Blower/Supply Hose Failures

1. Do any of the following Graphical Caregiver Interface (GCI)® Control error codes or failures appear:

- 80—97
- 80—98
- 80—145—008
- blower noise excessive
- blocked or damaged supply hoses

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

2. Reset the bed and allow to initialize. Did the blower operate during initialization.

Yes **No**
↓ → Go to RAP 2.5.

3. Is the blower noise excessive.

Yes **No**
↓ → Inspect the supply hoses for blockages, breaks, and disconnection. Replace damaged hoses.

4. Remove the blower and inspect for glue pieces (refer to procedure 4.58). Does the blower contain glue pieces.

Yes **No**
↓ → Replace the blower (refer to procedure 4.58).

5. Replace the blower (refer to procedure 4.58) and both supply hoses.

2.5 Air Blower Malfunction

1. The TotalCare® Bed System air blower did not operate during bed initialization.

   Yes No
   ↓ → Go to “Final Actions” on page 2-18.

2. Disconnect P1 of the air source cable from the blower housing and measure voltage between P1-4 and P1-5. Is voltage approximately 120V AC.

   Yes No
   ↓ → Check for damaged air source cable.

3. Press the **Enable key** and **Normal** control.

4. Measure voltage between P1-1 and P1-2. Does voltage rise to approximately + 12V DC within 1 minute.

   Yes No
   ↓ → Go to step 5.

5. Air blower circuit is functioning properly. Go to “Final Actions” on page 2-18.

6. Remove the covers from the TFSCM and measure the voltage from the heat sink to the connector side of PTC R23 on the TFSCM. Is voltage between 14.0V DC and 16.0V DC.

   Yes No
   ↓ → Go to step 8.

7. Check for a faulty air source cable, or signal distribution cable, or weighframe to surface cable (see figure 3-1 on page 3-7). Go to step 10.

8. Check voltage at fuse F6 on the PCM. Is voltage between 14.0V DC and 16.0V DC.

   Yes No
   ↓ → Check the fuse to make sure it is not blown. If it is blown, replace the fuse and check blower operation. If it is not blown, replace the PCM (refer to procedure 4.47).

9. Check for a faulty power distribution cable or faulty weighframe to surface cable (see figure 3-1 on page 3-7).

10. Are any of the cables damaged

    Yes No
    ↓ → Replace the TFSCM (refer to procedure 4.60).

11. Replace the damaged cable. Check the blower operation again.

12. The TotalCare® Bed System air blower did operate during bed initialization.

    Yes **No**
    ↓ → Call Hill-Rom Technical Support at (800) 445-3720.

13. Go to “Final Actions” on page 2-18.

2.6 System Power Failures

AC Power Failure

WARNING:
Install the hilow cylinder safety brace, and set the brakes before working under the raised section of the bed system. Failure to do so could result in personal injury or equipment damage.

1. Install the hilow cylinder safety brace. See "Hilow Cylinder Brace—SA1695" on page 4-21.

2. The Unplugged AC indicator is **on** with the system power cord plugged into an appropriate power source.

   Yes **No**
   ↓ → Go to"Initial Actions" on page 2-8.

3. Unplug the bed system from its power source. Using a voltmeter measure voltage at the power source. The voltage measures 104 to 127 V AC.

   Yes **No**
   ↓ → Report the problem to the facility maintenance representative.

4. Inspect the power cord and plug connections. The power cord and connections are in good condition, without bent contacts or loose connections.

   Yes **No**
   ↓ → Replace the power cord/plug.

5. Perform the following:
   a. Verify that the bed system is unplugged.
   b. Using a T25 Torx®[1] wrench, remove the base assembly cover.
   c. Using a T15 Torx® wrench, remove the power control module cover. See "Power Control Module P.C. Board" on page 4-150.
   d. Disconnect the battery connector P15 from the power control module P.C. board. See "Power Control Module P.C. Board" on page 4-150.
   e. Inspect the wiring on the header connector P11 on the power control module P.C. board, for loose/damaged connections.

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[1] Torx® is a registered trademark of Textron, Inc.

6. All connections at the connector P11 are in good condition.

   Yes **No**
   ↓ → Repair the connection, or replace the power cable.

7. Using a voltmeter meter, check the 15A 3AG power fuses, F13 and F14, for electrical continuity (see table 2-14 on page 2-130) and "Power Control Module P.C. Board" on page 4-150). The meter indicates electrical continuity.

   Yes **No**
   ↓ → Replace the damaged fuse with a 15A 3AG fuse.

8. Perform the following:

   a. Plug the system into an appropriate power source.

   b. Set the voltmeter scale to the AC scale, and at connector P11, measure the voltage from P11-1 to P11-2. The voltage measures 104 to 127V AC.

   Yes **No**
   ↓ → Go to step 8.

9. The same correct AC voltage is present at both the input and output of the AC line filter See "Transformer" on page 4-147.

   Yes **No**
   ↓ → Replace the AC line filter (refer to procedure 4.46).

10. The transformer voltage taps are producing the correct AC voltages.

    Yes **No**
    ↓ → Replace the transformer (refer to procedure 4.46).

11. Go to "Final Actions" on page 2-18.

Low Voltage Power Failure

1. Unplug the bed system from its power source. Using an AC voltmeter, measure the voltage at the power source. The voltage measures 104 to 127V AC.

   Yes No
   ↓ → Report the problem to the facility maintenance representative.

2. Inspect the power cord and plug connections. The power cord and connections are in good condition, without bent contacts or loose connections.

   Yes No
   ↓ → Replace the power cord/plug.

3. Perform the following:
   a. Using a T15 Torx®[1] wrench, remove the base assembly cover (see figure 4-3 on page 4-25).
   b. Using a T25 Torx® wrench, remove the power control module cover See “Power Control Module P.C. Board” on page 4-150.
   c. Disconnect the battery connector P15 from the power control module P.C. board (see figure 4-55 on page 4-153).
   d. Inspect the wiring and plug connections on the power control P.C. board.

   The connectors are tight and free of damage.

   Yes No
   ↓ → Repair or replace the damaged connectors.

4. Plug the bed system into an appropriate power source. Using a DC voltmeter, verify that + 23V is present at the output of the full-wave bridge assembly. The correct voltage is present.

   Yes No
   ↓ → Replace the full-wave bridge rectifier. See “Transformer” on page 4-147.

5. Unplug the bed system from the power source.
   a. Using a voltmeter, check the 15V DC, 5A power fuses F17 and F18, for electrical continuity (see table 2-14 on page 2-130) and figure 4-54 on page 4-152). The meter indicates electrical continuity.

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[1] Torx® is a registered trademark of Textron, Inc.

Yes No
↓ → Replace the damaged 5A Nano SM fuse.

b. Using a voltmeter, check the 8.5V DC, 7A power fuse, F5, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 7A Nano SM fuse.

c. Using a voltmeter, check the VBB, 3.5A power fuse, F2, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 3.5A Nano SM fuse.

d. Using a voltmeter, check the + 15V DC_MTS, 3.5A power fuse, F6, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 3.5A Nano SM fuse.

e. Using a voltmeter, check the + 15V DC, 3.5A power fuse, F8, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 3.5A Nano SM fuse.

f. Using a voltmeter, check the VBAT, 1.5A power fuse, F9, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 1.5A Nano SM fuse.

g. Using a voltmeter, check the + 15 V_VBAT, 1.0A power fuse, F10, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 1.0A Nano SM fuse.

h. Using a voltmeter, check the PCM, 1.5A power fuse, F1, for electrical continuity. The meter indicates electrical continuity.

Yes No
↓ → Replace the damaged 1.5A Nano SM fuse.

6. With the bed system plugged in and all fuses good, the power supplies are functioning correctly.

Yes No
↓ → Replace the Power Control Module P.C. board. See “Power Control Module P.C. Board” on page 4-150.

7. Connect the battery connector P15 to the power control module P.C. board.
8. Go to “Final Actions” on page 2-18.

Power Control Module Fuse Description

For a list of the power control module fuse numbers, circuit current protection (Amp), and description of the applicable circuits protected, refer to table 2-14 on page 2-130. For the location of each fuse, refer to “P.C. Board Component Layout—Power Control P/N 4704101/02 Top” on page 5-120.

Table 2-14. Power Control Module Fuse Description

Fuse No.	Amp	Circuit Description
F1—14V DC	1.5	PCM
F2—8V DC	3.5	VBB—GCI, SM, TFSCM, TSCM, PVCM, SCM
F5—23V DC	7.0	8.5V
F6—15V DC	3.5	+ 15V_MTS—TFSCM, TSCM, PVCM, SCOM
F7—13.5V DC	7.0	Battery voltage
F8—15V DC	3.5	+ 15V—SCOM
F9—8V DC	1.5	VBAT—Left UCM, Right UCM, SCOM, PCM, RBSM
F10—15V DC	1.0	+ 15V_VBAT—SCOM, RBSM, PCM
F11—15V DC	7.0	+ 15V_VBAT_PD
F12—230V AC	6.3	Primary fuse neutral, time-delay, 230V AC
F13—120V AC	15	Primary fuse neutral, time-delay, 120V AC
F14—120V AC	15	Primary fuse line, time-delay, 120V AC
F15—230V AC	6.3	Primary fuse line, time-delay, 230V AC
F16—23V DC	1.0	Battery charger
F17—23V DC	5.0	15V regulator
F18—23V DC	5.0	15V regulator

2.7 Enable Key Control Malfunction

CAUTION:
Do not interchange the right and left siderail main caregiver positioning P.C. boards. Damage to the equipment can occur.

1. Press the **Enable key** control on the intermediate siderail caregiver control panel. The **Enable key** control indicator light illuminates.

   Yes **No**
   ↓ → Replace the caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

2. The illuminated indicator on the **Enable key** control light goes out after 20 seconds.

   Yes **No**
   ↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

3. Press the **Enable key** control on the intermediate siderail caregiver control panel. The caregiver controls are operational.

   Yes **No**
   ↓ → Ensure the lockout controls are off. If the problem still exists, replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. If the problem still exists, check the siderail cabling, and/or replace the weigh frame electrical junction box P.C. board. See "Weigh Frame Junction Electrical Box" on page 4-155.

4. Go to "Final Actions" on page 2-18.

2.8 Lockout Control Malfunction

Knee Lockout

1. Simultaneously press the **Knee** Lockout control and the **Enable key** control. The **Knee** Lockout control indicator illuminates, and the annunciator beeps twice.

Yes **No**

↓ → Replace the caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

2. The **Knee** Lockout and indicator pass all functional checks.

Yes **No)**

↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. For additional indicator troubleshooting methods, refer to RAP 2.10.

⚠ **CAUTION:**
The right and left siderail main caregiver control P.C. board cannot be interchanged with one another. Damage to equipment can occur.

3. Press the **Knee up/down** controls. The knee section does not move.

Yes **No**

↓ → Replace the caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

4. Simultaneously press the **Knee** Lockout control and the **Enable key** control. The indicator light on the **Knee** Lockout control goes out.

Yes **No**

↓ → Replace the caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

5. The problem is solved.

   Yes **No**
   ↓ → Check the siderail P.C. board cabling for proper connections.

6. The problem is solved.

   Yes **No**
   ↓ → Replace the weigh frame electrical junction box P.C. board. See "Weigh Frame Junction Electrical Box" on page 4-155. (For additional indicator troubleshooting methods, see RAP 2.10.)

7. Go to "Final Actions" on page 2-18.

Head Lockout

1. Simultaneously press the **Head** Lockout control and the **Enable key** control. The **Head** Lockout control indicator illuminates, and the annunciator beeps twice.

   Yes **No**
   ↓ → Verify that function operates on the opposite siderail by simultaneously pressing the **Head** Lockout control and the **Enable key** control on the opposite siderail.

2. The problem is solved.

   Yes **No**
   ↓ → Replace the caregiver control panel **Head** Lockout and/or **Enable key** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. Return the P.C. boards to their original positions.

4. The **Head** Lockout and indicator pass all functional checks.

   Yes **No**
   ↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. For additional indicator troubleshooting methods, see RAP 2.10.

5. Go to “Final Actions” on page 2-18.

⚠ **CAUTION:**
The right and left siderail main caregiver positioning P.C. board cannot be interchanged with one another. Damage to equipment can occur.

6. The opposite siderail **Head** Lockout control, and the **Enable key** control indicator illuminates.

   Yes **No**
   ↓ → Replace the weigh frame junction electrical box P.C. board. See “Weigh Frame Junction Electrical Box” on page 4-155. For additional indicator troubleshooting methods, see RAP 2.10.

7. Press the **head up/down** arrow control. The head section does not move.

Yes **No**
↓ → Verify the **head up/down** function does not operate on the opposite siderail by simultaneously pressing the **Head** lockout control and the **Enable key** control on the opposite siderail.

8. The opposite bed siderail Head lockout control and the **Enable key** control indicator illuminates.

Yes **No**
↓ → Replace the caregiver control panel **Enable key** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

9. The problem is solved.

Yes **No**
↓ → Replace the caregiver control panel P.C. board in the intermediate siderail.

10. The problem is solved.

Yes **No**
↓ → Replace the weigh frame junction electrical box P.C. board. See “Weigh Frame Junction Electrical Box” on page 4-155. For additional indicator troubleshooting methods, see RAP 2.10.

11. Simultaneously press the Head lockout control and the **Enable key** control. The Head-Lockout control indicator extinguishes.

Yes **No**
↓ → Replace the caregiver control panel P.C. board in the intermediate siderail. See “Weigh Frame Junction Electrical Box” on page 4-155.

12. The problem is solved.

Yes **No**
↓ → Ensure the siderail cabling is properly connected.

13. The problem is solved.

Yes **No**
↓ → Replace the weigh frame electrical junction box P.C. board. See “Weigh Frame Junction Electrical Box” on page 4-155. For additional indicator troubleshooting methods, refer to RAP 2.10.

14. Go to “Final Actions” on page 2-18.

Bed Up/Bed Down (Hilow) Lockout

1. Simultaneously press the **Hilow** lockout control and the **Enable key** control. The **Hilow** lockout control indicator illuminates, and the annunciator beeps twice.

   Yes **No**
   ↓ → Verify that the function operates on the opposite siderail by simultaneously pressing the Bed up/down-Lockout control and the **Enable key** control on the opposite siderail.

2. The opposite siderail functions.

   Yes **No**
   ↓ → Replace the caregiver control panel **Bed up/Bed down** lockout and/or **Enable key** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. Return the P.C. boards to their original positions.

4. The **Hilow** lockout and indicator pass all functional checks.

   Yes **No)**
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. For additional indicator troubleshooting methods, see RAP 2.10.

5. The **Hilow** lockout and indicator pass all functional checks.

   Yes **No)**
   ↓ → Replace the weigh frame junction electrical box P.C. Board. See “Weigh Frame Junction Electrical Box” on page 4-155.

6. Go to “Final Actions” on page 2-18.

⚠ **CAUTION:**
The right and left siderail main caregiver positioning P.C. board cannot be interchanged with one another. Damage to equipment can occur.

7. The opposite bed siderail **Bed up/Bed down** lockout control and the **Enable key** control indicator illuminates.

   Yes **No**
   ↓ → Replace the weigh frame junction electrical box P.C. board. See “Weigh Frame Junction Electrical Box” on page 4-155. For additional indicator troubleshooting methods, see RAP 2.10.

8. Press the **Hilow** arrow control. The bed system does not move up or down.

   Yes **No**
   ↓ → Verify that the function does not operate on the opposite siderail by simultaneously pressing the **Bed up/Bed down** lockout control and the **Enable key** control on the opposite siderail.

9. Simultaneously press the **Hilow** lockout control and the **Enable key** control. The **Hilow** lockout control indicator goes out.

   Yes **No**
   ↓ → Replace the caregiver control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

10. There are no additional fault codes.

    Yes **No**
    ↓ → Replace the damaged system cabling.

11. Go to “Final Actions” on page 2-18.

Master Lockout

1. Simultaneously press the **Master** lockout control and the **Enable key** control. The **Master** lockout control indicator illuminates.

   Yes **No**
   ↓ → Verify the opposite siderail functions properly by simultaneously pressing the **Master** lockout control and the **Enable key** control on the opposite intermediate siderail. If the **Master** lockout control indicator illuminates.

2. The opposite siderail functioned normally.

   Yes **No**
   ↓ → Replace the caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. Place the P.C. boards in their original positions.

4. The system functions normally.

   Yes **No**
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. For additional indicator troubleshooting methods, refer to RAP 2.10.

5. Press all patient bed function controls and attempt operation of the Graphical Caregiver Interface (GCI)® Control. All controls are locked out and do not operate.

   Yes **No**
   ↓ → Replace the caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

6. The **Master** lockout and indicator pass all functional checks.

Yes **No**
↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

7. The **Master** lockout and indicator pass all functional checks.

Yes **No**
↓ → Replace the weigh frame electrical junction box P.C. board. See “Weigh Frame Junction Electrical Box” on page 4-155.

8. Simultaneously press the **Master** lockout control and the **Enable key** control. The indicator light on the **Master** lockout control goes out.

Yes **No**
↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. For additional indicator troubleshooting methods, refer to RAP 2.10.

9. The opposite siderail control panel functions properly.

Yes **No**
↓ → Repeat the above applicable troubleshooting steps.

10. Go to “Final Actions” on page 2-18.

2.9 Brake/Steer Malfunction

1. Step down on the steer pedal (green) of the brake/neutral/steer pedal to place it in the steer position. The **Brake not set** indicator illuminates.

   Yes **No**
   ↓ → Verify the adjustment and operation of the **Brake not set** control. See “Brake Set Sensor” on page 4-38.

2. Check for loose wires and cabling.

   Yes **No**
   ↓ → Go to RAP 2.10.

3. Push and pull on the bed system. The steer feature is fully engaged and the two foot end casters lock in the steer position.

   Yes **No**
   ↓ → Repair the brake/neutral/steer assembly. See “Brake/Steer Linkage” on page 4-41 and “Foot End Caster Assembly” on page 4-26 for caster replacement and adjustment procedures.

4. The head end casters can swivel 360°.

   Yes **No**
   ↓ → Repair the brake/neutral/steer pedal assembly. See “Head End Caster Assembly” on page 4-30 and the “Brake/Steer Linkage” on page 4-41.

5. Step down on the brake pedal (orange) of the brake/neutral/steer pedal to place it in the brake position. The **Brake not set** indicator goes out.

   Yes **No**
   ↓ → Verify the operation of the **Brake not set** control. See “Brake Set Sensor” on page 4-38. For additional indicator troubleshooting methods, refer to RAP 2.10.

6. Push and pull on the bed system. The brake function is fully engaged, all four casters are locked, and the bed system does not move.

   Yes **No**
   ↓ → Adjust the caster brakes. See “Foot Brake Pedal” on page 4-45.

7. Position the brake/neutral/steer pedal in the level (neutral) position. The **Brake not set** indicator light illuminates.

   Yes **No**
   ↓ → Verify the operation of the **Brake not set** control. See “Brake Set Sensor” on page 4-38.

8. The **Brake not set** indicator illuminates.

Yes **No**
↓ → Go to RAP 2.10.

9. All four casters can swivel 360°.

Yes **No**
↓ → Adjust the caster brake-to-wheel gap. See "Foot Brake Pedal" on page 4-45). (This step is not applicable to dual-wheel casters.)

10. Go to "Final Actions" on page 2-18.

2.10 Indicators (LED) Do Not Illuminate

1. If the Graphical Caregiver Interface (GCI)® Control screen is dark, press the **ENTER** control. The Graphical Caregiver Interface (GCI)® Control screen illuminates.

   Yes **No**
   ↓ → Verify that the left power cord is plugged into a power receptacle.

2. Unplug the bed system from its power source. The **Unplugged** AC power indicator illuminates, and after 30 seconds the Graphical Caregiver Interface (GCI)® Control darkens.

   Yes **No**
   ↓ → Check the **Unplugged** AC power indicator on the left-hand intermediate siderail.

3. Plug the bed system into its power source. The **Service required** and the **Chair position** indicator lights are off.

   Yes **No**
   ↓ → Verify the **Service required** and the **Chair position** indicators on the left-hand intermediate siderail are off.

4. The **Bed exit** indicator light is off with a person on the sleep surface and remains on without a person on the sleep surface.

   Yes **No**
   ↓ → Verify the bed exit cable is plugged into connector P-22 on the power control P.C. board.

5. The indicator lights function normally.

   Yes **No**
   ↓ → Replace the power control P.C. board mounted on the base frame. See “Power Control Module P.C. Board” on page 4-150.

   The **Unplugged** AC power indicator light is off.

   Yes **No**
   ↓ → Check the **Unplugged** AC power indicator on the left-hand side intermediate siderail.

6. The **Unplugged** AC power indicator lights function properly on both siderails.

   Yes **No**
   ↓ → Troubleshoot the damaged siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

7. With the bed system unplugged, the ± (Battery Power) charged indicator light illuminates (this applies only to bed systems equipped with the battery control option, and whose battery is charged).

   Yes No
   ↓ → Replace the battery.

   The ± (Battery Power) low indicator light is not flashing.

   Yes No
   ↓ → The battery is low and/or needs to be replaced. See “Battery” on page 4-145.

8. Set the brake/neutral/steer pedal to the Brake position. The **Brake not set** indicator light is off.

   Yes No
   ↓ → The **Brake not set** control is improperly adjusted. Verify that the control cable is properly attached to the **Brake not set** control and is not loose. Replace the control cable if it is frayed or cut.

9. Release the brake/neutral/steer pedal from the brake position. The **Brake not set** indicator illuminates.

   Yes No
   ↓ → The **Brake not set** control is improperly adjusted.

10. Verify that the control cable is properly attached to the **Brake not set** control and is in good condition (not frayed, cut, or loose).

    Yes No
    ↓ → Repair or replace the cable.

11. Make sure the room light is off, and place your finger to cover the night light sensor.

12. Press the **Night light** control several times. The night light toggles **on** and **off**.

    Yes No
    ↓ → If the bulb is burned out or loose, replace it. If this solves the problem, go to“Final Actions” on page 2-18. Otherwise go to Step 13.

13. The night light can be toggled **on** or **off** with the opposite siderail control.

    Yes No
    ↓ → Replace the caregiver control panel **Night light** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For

troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

14. Place the P.C. boards in their original positions.

15. The **Night light** control can toggle the lamp off and on.

Yes **No**
↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

16. Repeat the above procedures for the siderail control panel controls on the opposite side of the bed system.

17. Go to “Final Actions” on page 2-18.

2.11 Bed Down Control Will Not Lower Bed

1. Place the bed system in a flat, high position. Press and hold the **Bed down** control. The bed system lowers.

   Yes **No**
   ↓ → Determine if the bed system can be lowered using the opposite bed siderail **Bed down** control.

2. The bed system lowers with the opposite siderail **Bed down** control.

   Yes **No**
   ↓ → Replace the caregiver control panel **Bed down** control P.C. board in the head siderail. See "Head Siderail P.C. Board" on page 4-59. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. The bed system lowers normally.

   Yes **No**
   ↓ → Verify that the hilow hydraulic valve coil is operating. There should be a click sounded each time the **Bed down** control is depressed due to the actuation of the hydraulic valve. See "Hydraulic Valve" on page 4-91.

4. There is an audible click each time the bed down control is depressed.

   Yes **No**
   ↓ → Place a piece of iron bearing metal plate near the face of the electric coil. The coil should have sufficient magnetic strength to attract the metal plate each time the **Bed down** control is depressed. See "Hydraulic Manifold Valve Coil" on page 4-89.

5. The metal plate is attracted to the electric coil face each time the **Bed down** control is depressed.

   Yes **No**
   ↓ → Check the voltage at the harness leads. If the voltage is correct, replace the valve coil. See "Hydraulic Manifold Valve Coil" on page 4-89.

6. The bed system lowers and raises normally.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched.

7. Only the head section articulates downward.

Yes **No**
↓ → Check that hydraulic valve coil #14 is functional. See "Hydraulic Valve" on page 4-91.

8. The foot end only operates downward.

Yes **No**
↓ → Check that hydraulic valve coil #16 is functional. See "Hydraulic Valve" on page 4-91.

9. Place the bed system in a flat, high position. Press and hold the **Bed down** control. While the bed system is lowering, release the **Bed down** control. The bed system should stop.

Yes **No**
↓ → Verify that the hilow hydraulic valve is seating.

10. The bed system lowers and raises normally.

Yes **No**
↓ → Check the hydraulic hose connectors for leaks and torque the hydraulic fittings only if they are leaking fluid. See "Hydraulic Valve" on page 4-91.

11. Go to "Final Actions" on page 2-18.

2.12 Bed Up Control Does Not Raise Bed

1. Place the bed system in a flat, low position. Press and hold in the **Bed up** control. The bed system rises.

   Yes **No**
   ↓ → Verify that the hydraulic pump motor runs when the **Bed up** control is depressed. See “Hydraulic Power Unit (P1900A and P1900B Models Only)” on page 4-94.

2. The hydraulic pump and motor operate normally.

   Yes **No**
   ↓ → Determine if the bed system can be raised using the opposite bed siderail **Bed up** control.

3. The bed system rises normally using the opposite siderail **Bed up** control.

   Yes **No**
   ↓ → Replace the suspected caregiver control panel **Bed up** control P.C. board in the head siderail. See “Head Siderail P.C. Board” on page 4-59. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

4. The bed system rises normally.

   Yes **No**
   ↓ → The hilow hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89. The hydraulic valve should sound a click each time the Chair control is depressed. See “Hydraulic Valve” on page 4-91.

5. There is an audible click each time the **Bed up** control is depressed.

   Yes **No**
   ↓ → Remove the *bed up* hydraulic manifold valve coil from the valve stem (core) and place a piece of iron bearing metal plate near the face of the electric coil. The coil should have sufficient magnetic strength to attract the metal plate each time the **Bed up** control is depressed. See “Hydraulic Manifold Valve Coil” on page 4-89.

6. The metal plate is attracted to the electric coil face each time the **Bed up** control is depressed.

Yes No
↓ → Replace the valve coil. See "Hydraulic Manifold Valve Coil" on page 4-89.

7. Only the head section articulates upward.

Yes No
↓ → Check that hydraulic valve coil #15 is functional. See "Hydraulic Manifold Valve Coil" on page 4-89.

8. Only the foot section articulates upward.

Yes No
↓ → Check that the hydraulic valve coil #13 is functional. See "Hydraulic Manifold Valve Coil" on page 4-89.

9. The bed system raises normally.

Yes No
↓ → Check that the hydraulic hoses are not kinked, pinched, or leaking. Torque or replace when necessary.

10. Place the bed system in a flat, low position. Press and hold the **Bed up** control. While the bed system is rising, release the **Bed up** control. The bed system stops and does not drift downward.

Yes No
↓ → Verify that the hilow hydraulic valve is seating. See "Hydraulic Valve" on page 4-91.

11. Go to "Final Actions" on page 2-18.

2.13 Chair Position Control Malfunction

NOTE:
Make sure the bed system is in the **Flat** position, the footboard is installed, the brakes are unlocked, and the bed system is in its lowest position.

1. Press and hold the **Chair** positioning control. The bed system begins to articulate.

   Yes **No**
   ↓ → The brakes are not locked. A periodic **beep** sounds, and the **Brake not set** indicator flashes. (The bed system will continue to articulate into the chair position, although the alarm is sounded).

2. Set the brakes. The Brake not set indicator extinguishes, and the periodic beep is silent.

   Yes **No**
   ↓ → Go to RAP 2.9.

3. With the bed system in the lowest position, the bed system raises 4" (10 cm) above the lower limit as the bed level remains at 0° Trendelenburg angle.

   Yes **No**
   ↓ → Verify the hydraulic pump motor runs when the **Chair** control is depressed.

4. The chair function operates when using the opposite siderail **Chair** control.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked, pinched, or leaking. Torque or replace when necessary.

5. The chair function operates when using either siderail **Chair** control.

   Yes **No**
   ↓ → Replace the suspected caregiver control panel **Chair** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

6. Place the P.C. boards in their original positions after use, and verify their operational condition by performing the functional checks.

7. The bed system articulates into the chair position using either side panel **Chair** control.

Yes **No**
↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

8. The bed system articulates into the chair position using either side panel **Chair** control.

Yes **No**
↓ → Verify that the hilow hydraulic valve coils are operating properly. There should be an audible click sounded each time the **Chair** control is depressed due to the actuation of the hydraulic valve. See “Hydraulic Manifold Valve Coil” on page 4-89 and “Hydraulic Valve” on page 4-91.

9. There is an audible click each time the **Bed down** control is depressed.

Yes **No**
↓ → Remove the *chair* hydraulic manifold valve coil from the valve stem (core), and place a piece of iron bearing metal plate near the face of the electric coil. The coil should have sufficient magnetic strength to attract the metal plate each time the **Chair** control is depressed. See “Hydraulic Manifold Valve Coil” on page 4-89.

10. The metal plate is attracted to the electric coil face each time the **Chair** control is depressed.

Yes **No**
↓ → Replace the valve coil. See “Hydraulic Manifold Valve Coil” on page 4-89.

11. Only the head end operates upward.

Yes **No**
↓ → Check the operation of hydraulic valve coil #13. See “Hydraulic Manifold Valve Coil” on page 4-89.

12. Only the foot end operates upward.

Yes **No**
↓ → Check the operation of hydraulic valve coil #15. See “Hydraulic Manifold Valve Coil” on page 4-89.

13. The foot section articulates down to 30° and pauses.

Yes **No**
↓ → Verify that **Foot down** hydraulic valve coils #6 and #7 are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

14. The foot section articulates normally.

Yes **No**
↓ → Check that the hydraulic hoses are not kinked, pinched, or leaking. Torque or replace when necessary.

15. The foot section articulates normally.

Yes **No**
↓ → Verify that the position sensors are functional. Calibrate the position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

16. The head section rises to 55°, pauses, and then travels to the upper limit.

Yes **No**
↓ → Verify that **Head up** hydraulic valve coils #1 and #2 are operating properly. There should be an audible click each time the **Head up** control is depressed. See “Hydraulic Manifold Valve Coil” on page 4-89.

17. The head section rises to 55°, pauses, and then travels to the upper limit.

Yes **No**
↓ → Check that the hydraulic hoses are not kinked, pinched, or leaking. Torque or replace when necessary. See “Hydraulic Valve” on page 4-91.

18. The head section rises to 55°, pauses, and then travels to the upper limit.

Yes **No**
↓ → Verify the position sensors are functional. Calibrate the position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

19. The foot section articulates down to 70°, retracts to the recliner position, and stops.

Yes **No**
↓ → Verify that the **Foot in** hydraulic valve coils #9 and #12 are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

20. The Foot section articulates down 70°, retracts (recliner position) and stops.

Yes **No**
↓ → Check for a loose or damaged position sensor, and calibrate the position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

21. The Foot section articulates down to 60° retracts (recliner position) and stops.

Yes **No**
↓ → Verify the **Foot down** hydraulic valve coils #6 and #7 are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

22. The foot section articulates down to 60° retracts (recliner position) and stops.

Yes **No**
↓ → Replace the damaged valves. See “Hydraulic Valve” on page 4-91.

23. A continuous audible tone sounds until the **Chair** positioning control is released, the **Remove ft board** indicator illuminates, and the **Chair position** indicator **flashes**.

Yes **No**
↓ → Check for a loose or damaged position sensor. Calibrate the position sensors. See “Footboard” on page 4-53.

24. Remove the footboard. The **Remove ft board** indicator extinguishes.

Yes **No**
↓ → Verify the operation of the footboard control located in the weigh frame left footboard mounting hole. See “Footboard” on page 4-53.

25. Press and hold the **Chair** positioning control. The bed system begins to articulate beyond 70°.

Yes **No**
↓ → Check for a loose or damaged position sensor.

26. As the bed system articulates towards the chair-egress position, make sure the **foot section** clears the floor. The **foot**, **chair** and **hilow** functions must reach their respective maximum mechanical limits.

Yes **No**
↓ → Verify that the **Foot out** hydraulic valve coils #9 and #12 and **Foot in** valve coils #10 and #11 are operating properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

27. Check that the hydraulic hoses are not kinked or pinched. Torque or replace the hydraulic fittings, if leaking. Replace damaged valves. See "Hydraulic Valve" on page 4-91. Check for a loose or a damaged position sensor. Calibrate position sensors. See "Articulation Position Sensing System Calibration" on page 4-11.

28. Release the **Chair position** control. The **Chair position** indicator remains illuminated.

Yes **No**
↓ → Determine if the chair position indicator is illuminated on the opposite siderail by pressing and releasing the **Chair** control. If so, replace the damaged siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. Verify the position sensor calibrations.

29. Unlock the brakes. The system sounds a periodic audible beep, and the **Brake not set** indicator flashes.

Yes **No**
↓ → Verify that the **Brake not set** control is properly adjusted. Go to RAP 2.9. See "Power Control Module P.C. Board" on page 4-150.

30. Set the brakes, and repeat the above procedures for the opposite siderail caregiver control panel.

Yes **No**
↓ → Verify that the **Brake not set** control is properly adjusted. Go to RAP 2.9. See "Power Control Module P.C. Board" on page 4-150.

31. Cycle the TotalCare® Bed System from the low flat position to the full chair position and back to low flat. Articulation time appears normal.

Yes **No**
↓ → Verify there are no restraints, obstructions, or accessories improperly attached to the frames. Check for proper hydraulic oil level in the reservoir, between the "A" and "B" level lines. Check for leaking hydraulic lines or cylinders. See "Hydraulic Power Unit (P1900A and P1900B Models Only)" on page 4-94 and RAP 2.35.

32. The observed time for downward articulation is normal.

Yes **No**
↓ → If the downward speed is slower than normal, check for a dirty or faulty valve. Clean or replace the valve. See “Hydraulic Valve” on page 4-91. In the event the down speed times are too fast, replace the down valve.

33. The system functions normally.

Yes **No**
↓ → Replace the hydraulic manifold and pump. See “Hydraulic Power Unit (P1900A and P1900B Models Only)” on page 4-94.

34. The system functions normally.

Yes **No**
↓ → The CPR valve is not partially activated. See “CPR Release Valve” on page 4-127.

35. The system functions normally.

Yes **No**
↓ → The foot articulation times are to slow. Replace the foot articulation rod valve S7.

36. The system functions normally.

Yes **No**
↓ → The retraction time is not too slow. Replace the foot retraction rod valve S11.

37. The system functions normally.

Yes **No**
↓ → If the problem persists, replace the hydraulic manifold and pump. See “Hydraulic Power Unit (P1900A and P1900B Models Only)” on page 4-94 and RAP 2.35.

38. Go to “Final Actions” on page 2-18.

2.14 Bed Flat Control Will Not Flatten Bed

NOTE:
Make sure that the bed system is in the chair-egress position. Make sure the brakes are locked. If the brakes are not locked, a periodic beep sounds, and the **Brake not set** indicator flashes.

1. Press an enabled **Flat** control. The bed system articulates, and the **Chair position** indicator flashes.

   Yes **No**
   ↓ → Verify there are no function lockouts applied.

2. Determine if the same function operates on the opposite siderail by pressing and holding in the opposite caregiver siderail **Flat** control.

   Yes **No**
   ↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. Place the P.C. boards in their original positions.

4. The system functions normally.

   Yes **No**
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

5. The system functions normally.

   Yes **No**
   ↓ → Verify the hilow hydraulic valve coils are operating properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

6. The system functions normally.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched.

7. The system functions normally.

   Yes **No**
   ↓ → Torque/replace the hydraulic fittings, if leaking.

8. The system functions normally.

Yes **No**
↓ → Replace the damaged valves. See “Hydraulic Valve” on page 4-91.

9. Only the head end operates downward.

↓ → Check the hydraulic valve coil #14. See “Hydraulic Manifold Valve Coil” on page 4-89.

10. Only the foot end operates downward.

11. Check the hydraulic valve coil #2. See “Hydraulic Manifold Valve Coil” on page 4-89.

12. The system functions normally.

Yes **No**
↓ → Verify the hilow hydraulic valve is seating.

13. The system functions normally.

Yes **No**
↓ → Check all hydraulic hose fittings for leaks. Torque the hydraulic fittings only if they are leaking fluid. See “Hydraulic Valve” on page 4-91 for torquing instructions.

14. As the foot section reaches 60°, the bed system pauses, and an audible beep sounds.

Yes **No**
↓ → Calibrate the position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

15. With the footboard installed, the **Remove ft board** indicator illuminates.

Yes **No**
↓ → Verify the footboard control is operational. See “Footboard” on page 4-53.

16. Press and hold the **Flat** control. The **Remove ft board** indicator illuminates before the foot section reaches 30° where the bed system pauses, an audible beep sounds, when the head section is at 55°, the bed pauses, and then continues to lower.

Yes **No**
↓ → Calibrate the position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

17. The system functions normally.

Yes **No**
↓ → Verify the footboard control is functioning properly.

18. As the foot and the head sections reach the flat position, make sure the head, knee and foot sections are at the flat position (0° Trendelenburg angle).

Yes **No**
↓ → Calibrate the position sensors. See "Articulation Position Sensing System Calibration" on page 4-11.

19. Repeat the above procedures for the opposite siderail control panel.

Yes **No**
↓ → Determine if the same function operates on the opposite siderail by pressing and holding in the opposite caregiver siderail **Flat** control.

20. The opposite siderail functions normally.

Yes **No**
↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

21. The system functions normally.

Yes **No**
↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

22. Go to "Final Actions" on page 2-18.

2.15 Caregiver Control Malfunction—Head Siderail and Intermediate Siderail

Head Siderail

1. Press the **bed up** arrow control. The bed system rises.

   Yes No
   ↓ → Verify that the hilow hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

2. The system functions normally.

   Yes No
   ↓ → Check that the hydraulic hoses are not kinked or pinched. Torque/replace the hydraulic fittings only if they leak fluid. See “Hydraulic Valve” on page 4-91.

3. The system functions normally.

   Yes No
   ↓ → Replace damaged valves. See “Hydraulic Valve” on page 4-91 and RAP 2.35.

4. Only the head end operates upward.

   Yes No
   ↓ → Check hydraulic valve coil #13.

5. Only the foot end operates upward.

   Yes No
   ↓ → Check hydraulic valve coil #15. See “Head Hydraulic Cylinder” on page 4-111 and RAP 2.23.

6. The system functions normally.

   Yes No
   ↓ → Determine if function operates on the opposite siderail by pressing the **Bed up** control. See RAP 2.12 for additional troubleshooting techniques.

7. Press the **bed down** arrow control. The bed system lowers.

   Yes No
   ↓ → Determine if the bed down function operates on the opposite siderail by pressing the **Bed down** control.

8. The system functions normally.

Yes **No**
↓ → Replace the caregiver control panel P.C. board in the head siderail. See “Siderail Mechanism Does Not Hold” on page 2-183. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

9. Place the P.C boards in their original positions.

10. The system functions normally.

Yes **No**
↓ → Troubleshoot the weigh frame junction P.C. board. See “Weigh Frame Junction P.C. Board” on page 4-159.

11. The system functions normally.

Yes **No**
↓ → If the problem persists, verify the hilow hydraulic valve coil is operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

12. The system functions normally.

Yes **No**
↓ → Check that the hydraulic hoses are not kinked or pinched. Torque the hydraulic fittings only if they are leaking fluid. See “Hydraulic Valve” on page 4-91.

13. Only the head end operates downward.
↓ → Check the hydraulic valve coil #14. If only the foot end operates downward, check the hydraulic valve coil #16. See “Hydraulic Valve” on page 4-91.

14. Go to “Final Actions” on page 2-18.

Intermediate Siderail—Head Up/Head Down

1. Press the **head up/head down** arrow control. The head section raises/lowers.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched. Torque/replace the hydraulic fittings only if they leak fluid.

2. The system functions normally.

   Yes **No**
   ↓ → Verify that the hilow hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

3. The system functions normally.

   Yes **No**
   ↓ → Replace the damaged valves. See “Hydraulic Valve” on page 4-91 and RAP 2.35.

4. The system functions normally.

   Yes **No**
   ↓ →

   If only the head end operates upward, check the hydraulic valve coil #13. See “Hydraulic System Malfunction” on page 2-202.

5. The system functions normally.

   Yes **No**
   ↓ → If only the foot end operates upward, check the hydraulic valve coil #15. See “Head Hydraulic Cylinder” on page 4-111.

6. The system functions normally.

   Yes **No**
   ↓ → Replace the caregiver control panel **Head up/Head down** control P.C. board in the intermediate siderail. See “Siderail Mechanism Does Not Hold” on page 2-183.

7. The system functions normally.

   Yes **No**
   ↓ → Go to RAP 2.12 for additional troubleshooting techniques.

8. The system functions normally.

   Yes **No**
   ↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient

Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

9. The system functions normally.

   Yes **No**
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

10. Go to "Final Actions" on page 2-18.

Intermediate Siderail—Knee Up/Knee Down

1. Press the **Knee up/Knee down** arrow control. The knee section rises/lowers.

   Yes **No**
   ↓ → Verify the opposite siderail functions.

2. The opposite siderail functions normally.

   Yes **No**
   ↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. The system functions normally.

   Yes **No**
   ↓ → Verify that the hydraulic pump motor operates.

4. The opposite siderail functions normally.

   Yes **No**
   ↓ → Verify the hydraulic fluid reservoir has sufficient fluid. See "Hydraulic System Oil Fill" on page 4-87.

5. The system functions normally.

   Yes **No**
   ↓ → Check the hydraulic lines for kinks and leaks. Torque/replace the hydraulic fittings only if they leak fluid. See "Hydraulic Fluid Leak" on page 2-205.

6. The system functions normally.

   Yes **No**
   ↓ → Check operation of the hydraulic coils. See "Hydraulic Manifold Valve Coil" on page 4-89.

7. The system functions normally.

   Yes **No**
   ↓ → See "Hilow Foot Hydraulic Cylinder" on page 4-103.

8. The system functions normally.

   Yes **No**
   ↓ → Check the operation of the head hydraulic cylinder. See “Hilow Head Hydraulic Cylinder” on page 4-107.

9. The system functions normally.

   Yes **No**
   ↓ → Check the operation of the knee hydraulic cylinder. See “Knee Hydraulic Cylinder” on page 4-115.

10. Go to “Final Actions” on page 2-18.

Intermediate Siderail—Foot Up/Foot Down

1. Press an enabled **Foot up/Foot down** arrow control. The foot section raises/lowers.

   Yes **No**
   ↓ → Verify the opposite siderail functions are normal.

2. The opposite siderail functions normally.

   Yes **No**
   ↓ → Verify that the hydraulic pump motor operates.

3. The system functions normally.

   Yes **No**
   ↓ → Check hydraulic lines for kinks and leaks. Torque/replace the hydraulic fittings only if they leak fluid. See “Hydraulic Fluid Leak” on page 2-205.

4. The system functions normally.

   Yes **No**
   ↓ → Verify the hydraulic reservoir has the correct amount of fluid. See “Hydraulic System Oil Fill” on page 4-87 and RAP 2.36.

5. The system functions normally.

   Yes **No**
   ↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

6. Go to “Final Actions” on page 2-18.

Intermediate Siderail—Foot Out/Foot In

1. Press an enabled **Foot out**/**Foot in** arrow control. The foot section extends/retracts.

   Yes **No**
   ↓ → Verify the opposite siderail functions.

2. The opposite siderail functions normally.

   Yes **No**
   ↓ → Verify the hydraulic pump motor operates.

3. The system functions normally.

   Yes **No**
   ↓ → Verify the hydraulic fluid reservoir has the correct amount of fluid. See "Hydraulic System Oil Fill" on page 4-87.

4. The system functions normally.

   Yes **No**
   ↓ → Check the hydraulic lines for kinks and leaks. Torque/replace the hydraulic fittings only if they leak fluid. See "Hydraulic Fluid Leak" on page 2-205.

5. The system functions normally.

   Yes **No**
   ↓ → Verify that the hydraulic valve coils are functioning properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

6. The system functions normally.

   Yes **No**
   ↓ → Replace the suspected caregiver control panel Knee Up arrow control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

7. Go to "Final Actions" on page 2-18.

2.16 Reverse Trendelenburg/Trendelenburg Control Malfunction

1. With the bed system in the flat position, press the **Reverse Trendelenburg** control. The head section rises and stops at approximately 15° above the foot end of the bed.

   Yes **No**
   ↓ → Verify that the mechanical linkages of the position sensors are properly connected, and the sensor's cables are not broken, shorted, or disconnected.

2. The system functions normally.

   Yes **No**
   ↓ → Calibrate the position sensors. See "Articulation Position Sensing System Calibration" on page 4-11.

3. The system functions normally.

   Yes **No**
   ↓ → Ensure the hydraulic pump operates when the **Reverse Trendelenburg** control is pressed.

4. The system functions normally.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched. Only torque/replace hydraulic fittings that leak fluid.

5. The system functions normally.

   Yes **No**
   ↓ → Verify that the hilow hydraulic valve coils are operating properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

6. The system functions normally.

   Yes **No**
   ↓ → Replace the damaged valves. See "Hydraulic Valve" on page 4-91 and RAP 2.35.

7. Toggle the system from **Reverse Trendelenburg** to the **Trendelenburg** position. The system functions normally.

   Yes **No**
   ↓ → If only the head end operates upward, check the hydraulic valve coil #13.

8. The system functions normally.

   Yes **No**
   ↓ → If only the foot end operates upward, check the hydraulic valve coil #15.

9. The system functions normally.

   Yes **No**
   ↓ → Check the head hydraulic cylinder for proper operation. See "Head Hydraulic Cylinder" on page 4-111.

10. The system functions normally.

    Yes **No**
    ↓ → Check the **Trendelenburg** and **Reverse Trendelenburg** control P.C. boards. See "Siderail Mechanism Does Not Hold" on page 2-183.

11. The opposite siderail **Trendelenburg** or **Reverse Trendelenburg** controls operate the bed system.

    Yes **No**
    ↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

12. The system functions normally.

    Yes **No**
    ↓ → Replace the main caregiver control panel positioning P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. Go to step 14.

13. Go to "Final Actions" on page 2-18.

14. Press the **head up/head down** arrow control to head up. The knee section rises to 10° and stops while the head section rises to 55°, pauses, and continues up to the mechanical limits.

    Yes **No**
    ↓ → Verify that the opposite siderail functions properly.

15. The system functions normally.

Yes **No**
↓ → Verify the mechanical linkages of the position sensors are properly connected.

16. The system functions normally.

Yes **No**
↓ → Verify that the sensor cables are not broken, shorted, or disconnected. Ensure the position sensors are calibrated. See "Articulation Position Sensing System Calibration" on page 4-11.

17. The system functions normally.

Yes **No**
↓ → Verify that the hydraulic pump motor operates properly.

18. The system functions normally.

Yes **No**
↓ → See "Hydraulic System Oil Fill" on page 4-87.

19. The system functions normally.

Yes **No**
↓ → Check the hydraulic lines for kinks and leaks. Do not torque any fitting that is not leaking fluid. See "Hydraulic Fluid Leak" on page 2-205.

20. The system functions normally.

Yes **No**
↓ → Check the hydraulic manifold valve coil for proper operation. See "Hydraulic Manifold Valve Coil" on page 4-89.

21. The head section functions normally.

Yes **No**
↓ → Check the head hydraulic cylinder for proper operation. See "Head Hydraulic Cylinder" on page 4-111.

22. The foot section functions normally.

Yes **No**
↓ → Check the hilow Foot cylinder for proper operation. See "Hilow Foot Hydraulic Cylinder" on page 4-103.

23. The system functions normally.

Yes No
↓ → Replace the intermediate panel control P.C. Board. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

24. Return the bed system to the flat position. Press the **Reverse Trendelenburg** control. Toggle to **Trendelenburg**. The foot section rises and stops at approximately 15° above the head end of the bed system.

Yes No
↓ → Verify that the mechanical linkage of the position sensors are properly connected.

25. The system functions normally.

Yes No
↓ → Verify that the sensor cables are not broken, shorted, or disconnected. Ensure the position sensors are calibrated. See “Articulation Position Sensing System Calibration” on page 4-11.

26. The hydraulic pump operates when the **Trendelenburg** control is pressed.

Yes No
↓ → Check that hydraulic hoses are not kinked or pinched. Torque/replace only hydraulic fittings that leak fluid.

27. The system functions normally.

Yes No
↓ → Verify that hilow hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

28. The foot end functions normally.

Yes No
↓ → If only the head end operates upward, check the hydraulic valve coil #13. See “Hydraulic Manifold Valve Coil” on page 4-89.

29. The head end functions normally.

Yes No
↓ → If only the foot end operates upward, check the hydraulic valve coil #15. See “Hydraulic Manifold Valve Coil” on page 4-89.

30. The system functions normally.

Yes **No**
↓ → Check and replace damaged hydraulic valves. See "Hydraulic Valve" on page 4-91 and RAP 2.35.

31. The system functions normally.

Yes **No**
↓ → Replace the suspected caregiver control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

32. The opposite siderail control panels function properly.

Yes **No**
↓ → Repeat above procedures for the opposite siderail control panels. Go to step 34.

33. Go to "Final Actions" on page 2-18.

34. Press the **Head up/Head down** arrow control to raise the head up. The knee section rises to 10°, and stops while the head section raises to 55°, pauses, and continues up to the mechanical limits.

Yes **No**
↓ → Verify the mechanical linkages of the position sensors are properly connected.

35. The system functions normally.

Yes **No**
↓ → Verify that the sensor cables are not broken, shorted, or disconnected. Ensure the position sensors are calibrated. See "Articulation Position Sensing System Calibration" on page 4-11.

36. The hydraulic pump operates when the **Head Up** arrow control is pressed.

Yes **No**
↓ → Check that hydraulic hoses are not kinked or pinched. Torque/replace only hydraulic fittings that leak fluid.

37. The system functions normally.

Yes **No**
↓ → Verify that hilow hydraulic valve coils are operating properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

38. The head end functions normally.

Yes **No**
↓ → If only the foot end operates upward, check the hydraulic valve coil #15. See "Hydraulic Manifold Valve Coil" on page 4-89.

39. The system functions normally.

Yes **No**
↓ → Check and replace damaged hydraulic valves. See "Hydraulic Valve" on page 4-91 and RAP 2.35.

40. The opposite siderail control panels function properly.

Yes **No**
↓ → Repeat above procedures for the opposite siderail control panels.

41. Go to "Final Actions" on page 2-18.

2.17 Hilow Function Rises Unit Unevenly

1. Perform the following:
   a. Place the unit in the fully lowered position, and ensure that the sleep surface is flat.
   b. Using a stopwatch, check the travel time of the hilow cylinders as you use the hilow function to raise the unit with **no** weight present on the sleep surface.
   c. Refer to table 2-15 on page 2-173, and check the travel time of the first cylinder to reach its limit in the left-hand **Hilow Up** column.
   d. Compare the travel time of the second cylinder to the value in the right-hand **Hilow Up** column directly next to the travel time of the first cylinder.

   The second cylinder's travel time is within the specification indicated in the right-hand column.

   Yes No
   ↓ → Go to step 6.

2. Perform the following:
   a. Place the unit in the fully raised position, and ensure that the sleep surface is flat.
   b. Using a stopwatch, check the travel time of the hilow cylinders as you use the hilow function to lower the unit with **no** weight present on the sleep surface.
   c. Refer to table 2-15 on page 2-173, and check the travel time of the first cylinder to reach its limit in the left-hand **Hilow Down** column.
   d. Compare the travel time of the second cylinder to the value in the right-hand **Hilow Down** column directly next to the travel time of the first cylinder.

   The second cylinder's travel time is within the specification indicated in the right-hand column.

   Yes No
   ↓ → Go to step 6.

Table 2-15. Hilow Times

Hilow Up		Hilow Down	
Cylinder 1 time (in seconds)	Cylinder 2 time (in seconds)	Cylinder 1 time (in seconds)	Cylinder 2 time (in seconds)
30	30 - 33	30	30 - 33
31	31 - 34	31	31 - 34
32	32 - 35	32	32 - 35
33	33 - 36	33	33 - 36
34	34 - 37	34	34 - 37
35	35 - 38	35	35 - 38
36	36 - 39	36	36 - 39
37	37 - 40	37	37 - 40
38	38 - 41	38	38 - 41
39	39 - 42	39	39 - 42
40	40 - 43	40	40 - 43
41	41 - 44		
42	42 - 45		
43	43 - 46		
44	44 - 47		
45	45 - 48		

3. Perform the following:
   a. Place the unit in the fully lowered position, and ensure that the sleep surface is flat.
   b. Distribute a recommended weight of 250 lb (113 kg) on the unit as follows:
      - Place 112.5 lb (51.0 kg) on the head section.
      - Place 62.5 lb (28.4 kg) on the seat section.
      - Place 50 lb (23 kg) on the knee section.
      - Place 25 lb (11 kg) on the foot section.

NOTE:
If a load of 250 lb (113 kg) is not available, use a person laying on the unit to simulate the weight.

   c. Using a stopwatch, check the travel time of the hilow cylinders as you use the hilow function to raise the unit.
   d. Refer to table 2-15 on page 2-173, and check the travel time of the first cylinder to reach its limit in the left-hand **Hilow Up** column.
   e. Compare the travel time of the second cylinder to the value in the right-hand **Hilow Up** column directly next to the travel time of the first cylinder.

NOTE:
Some variability exists from one cycle to the next. Do not expect the same results for every cycle.

The second cylinder's travel time is within the specification indicated in the right-hand column.

Yes **No**
↓ → Go to step 6.

4. Perform the following:
   a. Place the unit in the fully raised position, and ensure that the sleep surface is flat.
   b. Using a stopwatch, check the travel time of the hilow cylinders as you use the hilow function to lower the unit.
   c. Refer to table 2-15 on page 2-173, and check the travel time of the first cylinder to reach its limit in the left-hand **Hilow Down** column.
   d. Compare the travel time of the second cylinder to the value in the right-hand **Hilow Down** column directly next to the travel time of the first cylinder.

   The second cylinder's travel time is within the specification indicated in the right-hand column.

   Yes **No**
   ↓ → Go to step 6.

5. The problem still exists.

   Yes **No**
   ↓ → Go to "Final Actions" on page 2-18.

6. Inspect the hydraulic hoses for kinks or anything restricting the flow of hydraulic fluid. The hydraulic hoses are free from kinks and restrictions.

Yes **No**
↓ → Replace the hydraulic hoses. If this solves the problem, go to "Final Actions" on page 2-18. Otherwise, go to step 7.

7. Replace the hydraulic power unit:

- On a P1900A or P1900B model, refer to procedure 4.31.
- On a P1900AC or newer model, refer to procedure 4.32.

This solves the problem.

Yes **No**
↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

8. Go to "Final Actions" on page 2-18.

2.18 Patient Controls Malfunction

NOTE:
Place the bed system in the flat position. The patient controls do not operate when the bed system uses the battery control option.

1. Press the **Head Up** control. As the head section raises, the knee section automatically raises. The knee section is limited to a maximum angle of 15°, and the head section goes to 55°, pauses, and continues to the limit.

   Yes **No**
   ↓ → Verify the mechanical linkages of the position sensors are properly connected.

2. The system functions normally.

   Yes **No**
   ↓ → Verify that the sensor cables are not broken, shorted, or disconnected. Ensure the position sensors are calibrated. See "Articulation Position Sensing System Calibration" on page 4-11.

3. The hydraulic pump operates when the **Head Up** arrow control is pressed.

   Yes **No**
   ↓ → Check that hydraulic hoses are not kinked or pinched. Torque/replace only hydraulic fittings that leak fluid.

4. The system functions normally.

   Yes **No**
   ↓ → Verify that hilow hydraulic valve coils are operating properly. See "Hydraulic Manifold Valve Coil" on page 4-89.

5. The system functions normally.

   Yes **No**
   ↓ → Check and replace damaged hydraulic valves. See "Hydraulic Valve" on page 4-91 and RAP 2.35.

6. The system functions normally.

   Yes **No**
   ↓ → Go to RAP 2.12 for additional troubleshooting techniques.

7. The opposite siderail control panels function properly.

   Yes **No**
   ↓ → Repeat the above troubleshooting procedures for the opposite siderail control panels.

8. Go to “Final Actions” on page 2-18.

2.19 CPR Release Malfunction

NOTE:
The caregiver controls are usable when the CPR release function is activated.

Foot Control

1. With the bed system in the chair-egress position and with a person who weighs more than 90 lb (41 kg) in the bed, hold the **CPR/TREN** control pedal down.

   The head section moves to the flat position within 10 seconds, and the foot/knee sections move to the flat position within 25 seconds.

   Yes **No**
   ↓ → If the head section fails to go down, press the foot pedal, and push downward on the head section. (If the head section goes down, then the head hydraulic cylinder may be too tight, or there may be an obstruction keeping the head section from coming down smoothly. Check and repair components as necessary).

2. The bed system functions normally.

   Yes **No**
   ↓ → Check the CPR linkage for proper adjustment. If the linkage is pulling the valve on the manifold, and the head section still does not come down, replace the manifold valve. See “CPR Release Valve” on page 4-127.

3. The bed system functions normally.

   Yes **No**
   ↓ → The actuation controls are properly adjusted and functional. See “CPR Sensor” on page 4-131 for access and safety precautions in working with the CPR feature. Operate the **CPR/TREN** foot lever up and down to determine the control actuation and spring-loaded mechanical centering of the control actuator.

4. Ensure the electrical signal cable connections are intact and not shorted.

5. Connector P20 is connected to the power control P.C. board. See “Power Control Module P.C. Board” on page 4-150.

6. The bed system functions normally.

Yes **No**
↓ → The **Service required** indicator illuminates, check the adjustment of the CPR actuation control. The control must make before the hydraulic valve is opened.

7. The bed system functions normally.

Yes **No**
↓ → Check that the hydraulic system is functional. See "Hydraulic System Oil Fill" on page 4-87, RAP 2.36, "Hilow Foot Hydraulic Cylinder" on page 4-103, and "Hilow Head Hydraulic Cylinder" on page 4-107.

8. The bed system functions normally.

Yes **No**
↓ → Check the mechanical linkages of the position sensors. Verify that sensor cables are not broken, shorted, or disconnected. Calibrate the position sensors. See "Articulation Position Sensing System Calibration" on page 4-11.

9. The treatment/sleep surface automatically inflates to a CPR ready surface.

Yes **No**
↓ → Go to RAP 2.38.

10. Go to "Final Actions" on page 2-18.

2.20 Emergency Trendelenburg Malfunction

1. With the bed system is in the flat position. Lift the **CPR/TREN** control release pedal with the foot. The head end lowers 15° below (relative to) the foot end.

   Yes No
   ↓ → Check the Emergency Trendelenburg linkage for adjustment. See “Emergency Trendelenburg Release Valve” on page 4-137 for access and precautions in working with the CPR feature.

2. Operate the CPR/TREN foot lever up and down. The spring loaded control actuator is mechanically centered between the micro-control leaf actuators.

   Yes No
   ↓ → Mechanically center the actuator between the **CPR/TREN** control levers. See “Trendelenburg Sensor” on page 4-134 and “CPR Sensor” on page 4-131.

3. The system functions normally.

   Yes No
   ↓ → The **Service required** indicator illuminates, check the adjustment of the Emergency Trendelenburg actuation control. The control must “make” before the hydraulic valve is opened.

4. The system functions normally.

   Yes No
   ↓ → Replace the Trendelenburg hydraulic valve.

5. The system functions normally.

   Yes No
   ↓ → Verify that both hilow cylinders are functioning properly. See “Hilow Foot Hydraulic Cylinder” on page 4-103 and “Hilow Head Hydraulic Cylinder” on page 4-107.

6. Go to “Final Actions” on page 2-18.

2.21 Trendelenburg/Reverse Trendelenburg Malfunction

1. If unable to place the bed system in the **Trendelenburg/Reverse Trendelenburg** position, press the **Bed Up/Bed Down** (hilow) arrow control to raise the bed system to a higher position. Lift the **CPR/TREN** control release pedal. The head end is 15° below the foot end.

   Yes No
   ↓ → Verify the **CPR/TREN** actuation controls are properly adjusted and functional. See “Emergency Trendelenburg Release Valve” on page 4-137 for access and safety precautions in servicing the Trendelenburg features.

2. The system functions normally.

   Yes No
   ↓ → Go to RAP 2.19.

3. Go to “Final Actions” on page 2-18.

2.22 Hydraulic Foot Pump Pedal Will Not Raise Bed

1. Raise the bed system with the optional hydraulic foot pump by pressing the **Bed Up** control and stepping down on the foot pump pedal repeatedly (maximum of 45 strokes).

2. The bed system rises as the foot pedal is repeatedly pumped.

   Yes No
   ↓ → Check for an audible solenoid valve click when the **Bed Up** control is depressed.

3. The solenoid valve clicks, and the bed system rises when using the foot pump.

   Yes No
   ↓ → Check that the battery is properly charged, and there are no bed obstructions.

4. The bed system functions normally.

   Yes No
   ↓ → Check the foot pump linkage. Check the hydraulic system for leaks. Go to RAP 2.36.

5. The bed system functions normally.

   Yes No
   ↓ → Check and replace the solenoid valve coil if the correct voltage is supplied to the solenoid coil.

6. The bed system functions normally.

   Yes No
   ↓ → Replace the hydraulic manifold.

7. Repeat steps 1 through 6 using the bed opposite side pump pedal and siderail. See “Caregiver Control Malfunction—Head Siderail and Intermediate Siderail” on page 2-158.

8. Go to “Final Actions” on page 2-18.

2.23 Siderail Mechanism Does Not Hold

1. From the low (stow) position, raise the siderail by pulling the siderail up until it clicks in the locked position.

   Yes **No**
   ↓ → Inspect for obstructions, missing hardware, or loose fasteners.

2. Grasp the top of the siderail, and push and pull firmly on the siderail. The siderail remains latched in the locked position.

   Yes **No**
   ↓ → Inspect for obstructions or loose fasteners.

3. Stow the siderail as follows: grasp and pull the release handle out, and allow the siderail to swing down in a controlled, dampened, manner to the fully stowed position.

   Yes **No**
   ↓ → Inspect for obstructions in the center arm, loose fasteners, missing spring, or binding.

4. Open the center arm and check for head siderail latch functionality.

5. Go to “Final Actions” on page 2-18.

2.24 SideCom® Communication System/Nurse Call Malfunction

1. With the SideCom® Communication System test apparatus attached to the SideCom® Communication System board, located in the head end bumper, press each **Nurse Call** control on the bed system one at a time. The nurse call indicator comes on as each control is pressed.

   Yes No
   ↓ → If the **Nurse Call** function operates on the opposite siderail, replace the suspected caregiver control panel nurse call control P.C. board. See “Nurse Call Switch P.C. Board” on page 4-70. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

2. The system functions normally.

   Yes No
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

3. The system functions normally.

   Yes No
   ↓ → Replace the SideCom® Communication System Nurse Call /Ped P.C. board. See “SideCom® Communication System and Nurse Call Module” on page 4-172.

4. Press the **TV** control on the patient control panel. The TV indicator comes on.

   Yes No
   ↓ → If pressing the **TV** control on the opposite siderail results in operating the room television set, then replace the suspected caregiver control panel TV control P.C. board in the intermediate siderail. See “SideCom® Communication System Entertainment/Lighting Module” on page 4-169. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

5. The system functions normally.

   Yes **No**
   ↓ → Verify connection between the SideCom® Communication System and the junction board. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67 and/or “SideCom® Communication System Entertainment/Lighting Module” on page 4-169.

6. Go to “Final Actions” on page 2-18.

2.25 Bed Exit Malfunction

1. The bed exit and alarm system functions properly.

   Yes **No**
   ↓ → Go to RAP 2.26.

2. Go to “Final Actions” on page 2-18.

2.26 Patient Exit/Priority Nurse Call Malfunction

1. With a reference weight greater than 75 lb (34.0 kg) on the bed, momentarily press the **Enable key** control; within 16 seconds, press the **Bed exit** control, and choose the alarm delay of either 0, 2, 4, or 6 seconds. As each control is pressed, an indicator comes on, one at a time.

   Yes No
   ↓ → Replace the caregiver control panel **Bed Exit detection** P.C. board located within the left-hand intermediate siderail **Bed Exit alarm** control panel. See “Patient Exit Detection Alarm” on page 4-73.

2. Press the enabled **Alarm on/off** control to **on**. The Alarm on/off indicator comes **on**.

   Yes No
   ↓ → Replace the caregiver control panel **Bed Exit** P.C. board in the **Bed Exit** module of the intermediate siderail. See “Patient Exit Detection Alarm” on page 4-73.

3. The system functions normally.

   Yes No
   ↓ → The **nurse call** control operates. Replace the SideCom® Communication System Nurse Call /PED P.C. board.

4. The system and LED indicators function normally.

   Yes No
   ↓ → The alarm system operates, but the indicators fail to function.

5. Remove the weight from the bed system. The bed exit alarm sounds continuously and places a priority nurse call to the nurse station.

   Yes No
   ↓ → Go to RAP 2.30.

6. Press the enabled **Alarm on/off** control to **off**. The audible bed exit alarm stops, and the priority nurse call is cancelled.

   Yes No
   ↓ → Replace the caregiver control panel **Alarm on/off** control P.C. board located in the bed exit alarm control panel.

7. The system functions normally.

Yes **No**
↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

8. The system functions normally.

   Yes **No**
   ↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

9. The system functions normally.

   Yes **No**
   ↓ → Replace the weigh frame junction P.C. board. See "Weigh Frame Junction P.C. Board" on page 4-159.

10. The system functions normally.

    Yes **No**
    ↓ → In the event the **nurse call** control operates, replace the SideCom® Communication System Nurse Call /Ped P.C. board.

11. If the alarm system operates, but the indicator fails to function, see RAP 2.10.

12. Go to "Final Actions" on page 2-18.

2.27 Night Light Does Not Illuminate

1. The patient floor night light comes on when the ambient light dims.

   Yes **No**
   ↓ → Replace the lamp bulb or fixture if damaged.

2. Verify the photocell functions.

   Yes **No**
   ↓ → Replace the photocell.

3. The system functions normally.

   Yes **No**
   ↓ → Verify that the night lamp cable connector is plugged into P-4 of the power control P.C. board. See “Night Light” on page 4-178.

4. The system functions normally.

   Yes **No**
   ↓ → Replace the power supply P.C. board. See “Power Control Module P.C. Board” on page 4-150.

5. Go to “Final Actions” on page 2-18.

2.28 Patient Entertainment Malfunction

1. Ensure the following has been taken care of:
    a. The SideCom® Communication System of the bed system must be connected to the room entertainment infrastructure.
    b. The room music system is operational.

2. Press the siderail **Music** control. The room music system is activated.

Yes **No**
↓ → Ensure all cabling is properly connected.

3. The system functions normally.

Yes **No**
↓ → Replace the caregiver control panel **Music** control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

4. The **Music** control operates.

Yes **No**
↓ → Replace the SideCom® Communication System—Entertainment/Lighting P.C. board. See "SideCom® Communication System Entertainment/Lighting Module" on page 4-169.

5. The system functions normally.

Yes **No**
↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

6. The system functions normally.

Yes **No**
↓ → Replace the weigh frame junction board. See "Weigh Frame Junction P.C. Board" on page 4-159.

7. With the Music enabled, press the **Music** control. The music is **off**.

Yes **No**
↓ → Replace the caregiver control panel **Music** control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

8. Press the patient **TV** control. The room television system is activated.

Yes **No**
↓ → Ensure the room TV is in the correct functional mode, and all cabling is properly connected.

9. The system functions normally.

Yes **No**
↓ → Replace the caregiver control panel **TV** control P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

10. After the TV works, press the **TV** control. The television system is **off**.

Yes **No**
↓ → Replace the main caregiver control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67 and RAP 2.24.

11. Go to “Final Actions” on page 2-18.

2.29 Patient Light Controls Malfunction

1. Press the siderail **Read** light control on the control panel. The patient read light comes on.

   Yes **No**
   ↓ → Check and replace the lamp bulb or fixture if damaged.

2. Press the siderail **Read** light control on the opposite siderail. The lamp functions when using the opposite siderail control.

   Yes **No**
   ↓ → Replace the suspected caregiver control siderail **Read** light control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

3. Press the siderail **Read** light control. The patient reading light system is activated.

   Yes **No**
   ↓ → Ensure the lamp bulb and all cabling are properly connected.

4. The system functions normally.

   Yes **No**
   ↓ → Replace the caregiver control panel **Read** control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

5. Press the siderail **Room** control. The room patient lighting system is activated.

   Yes **No**
   ↓ → Ensure all lamp bulbs and cabling are properly connected.

6. The system functions normally.

   Yes **No**
   ↓ → Replace the caregiver control panel **Room** control P.C. board in the intermediate siderail. See "Main Caregiver P.C. Board or Patient Control Switch P.C. Board" on page 4-67.

7. Go to "Final Actions" on page 2-18.

2.30 Scale/Graphical Caregiver Interface (GCI)® Control Malfunction

NOTE:
The patient weigh system calibration must be performed without the patient, and with the bed system free of all loose articles. The bed system must be on a level surface with the mattress in a flat position. The foot brake must be applied.

NOTE:
If the scale board or a load beam is replaced, the scale will have to be calibrated. To calibrate the scale, use the "Patient Weigh System Calibration (Non-NAWI Class IIII Scale Only)" on page 4-15.

1. Using the Graphical Caregiver Interface (GCI)® Control **Main Menu**, press and hold the up and down arrow control buttons simultaneously for approximately 20 seconds. The **Service menu** appears. Using the section "Patient Weigh System Calibration (Non-NAWI Class IIII Scale Only)" on page 4-15, proceed with the scale calibration. The calibration was successfully completed.

   Yes **No**
   ↓ → Verify that all cabling is properly connected, and the TotalCare® Bed System power cord is plugged into an appropriate power source.

2. The system functions properly.

   Yes **No**
   ↓ → The **Service indicator** lamp displays no fault codes. To troubleshoot the scale weigh system, see"Graphical Caregiver Interface (GCI)® Control" on page 4-82 and "Scale Control—Patient Exit Detection (PED) Module" on page 4-163. If the system still does not function properly, go to step 4.

3. Stow the Graphical Caregiver Interface (GCI)® Control. This completes the calibration of the TotalCare® Bed System weigh frame. Go to "Final Actions" on page 2-18.

4. The scale sends back a message such as "Center Patient in bed before proceeding." One of the load beam readings is out of range. Go to RAP 2.31.

5. The scale sends back a message such as “Task request cannot be achieved at this moment.” The Graphical Caregiver Interface (GCI)® Control cannot communicate with the scale, or the scale board is detecting errors. Go to RAP 2.32.

6. The weight is always 0. Zero the scale, apply weight, and then perform a weigh function. Perform the “Patient Weigh System Calibration (Non-NAWI Class IIII Scale Only)” on page 4-15 again.

7. The scale sends back a value at the end of calibration that is not a valid coefficient (value<100). There is a calibration error. Go to RAP 2.33.

2.31 Scale/Graphical Caregiver Interface (GCI)® Control Diagnostics and Error Troubleshooting

Diagnostics

1. The A/D readings for each channel need to be evaluated. This is done with the diagnostic commands sent to the scale.
   a. Hold the **UP** arrow key and **DOWN** arrow key on the Graphical Caregiver Interface (GCI)® Control for 20 seconds.
   b. Select *Diagnostics.*
   c. Select *Enter New Command.*
   d. Scroll the values for ID to *50* for the scale and *166* for command.
   e. Select *Send Node/command.*

NOTE:
After a couple of seconds, some values from the scale appear in the response field on the screen. The A/D readings for channel 0 (RF) are the first two response values (first and second position), and the next set of response values (third and fourth position) are the channel 1 (LF) A/D readings (see table 2-16 on page 2-195)).

Table 2-16. A/D Readings and Response Value Positions

Channel	ID	COM	Response Value Position
0 (RF)	50	166	First and second
1 (LF)	50	166	Third and fourth
2 (LH)	50	167	First and second
3 (RH)	50	167	Third and fourth

2. Calculate the actual value (counts) for the RF by multiplying the first position by 256 and adding the second position to that value. This can also be done for the LF. See the following example for channel 0 (RF):
   After this Node/command is sent, a response like this will be received:

ID	COM	Response
50	166	039 123 038 321 000 000

The A/D readings for channel 0 (RF) = 39 x 256 + 123 = 10107 counts

The A/D readings for channel 1 (LF) = 38 x 256 + 321 = 10049 counts

3. Calculate the values for the head beams the same way. The only differences are that you need to scroll the values for command (COM) to *167,* and the data is for channel 2 (LH) and channel 3 (RH).
4. If the counts you calculated are 0, or <500, the scale does not operate. The scale sends a code to the Graphical Caregiver Interface (GCI)® Control to display the error message "Center Patient in bed."
5. If all of the response values (first through fourth position) are 0 or 255, one of the load beams is shorted out. Go to RAP 2.34.
6. If only one of the four positions of the response value is 0, switch the beam connectors on the scale board, and view the readings again.
7. If the 0 value follows the load beam, the problem is in the load beam, wiring, or connector. Replace the load beam, if necessary (refer to procedure 4.51).
8. If the 0 value is still on the same channel, replace the damaged scale board (refer to procedure 4.50).
9. If the response is the problem, read the load beam value with diagnostics. See "Diagnostics" on page 2-195.
10. Add some weight to the bed, and record the new load beam value. When weight is applied to the bed, a working load beam shows an increase.

2.32 Scale/Graphical Caregiver Interface (GCI)® Control—Communication Error

1. Use diagnostics to test the communication between the scale and the Graphical Caregiver Interface (GCI)® Control. See "Diagnostics" on page 2-195, step 1 thru step c.

2. Scroll the values for ID to *50* for the scale and *100* for command.

3. Select *Send Node/command*.

4. After a couple of seconds, some values from the scale appear in the response field on the screen.

5. The scale responds with values from 0 through 5.

   Yes **No**
   ↓ → Check the wiring between the PCM and the scale. The scale board could be damaged, or the problem may be the Graphical Caregiver Interface (GCI)® Control. To help determine the problem, replace the scale board (refer to procedure 4.50) or the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26).

6. This confirms the scale and Graphical Caregiver Interface (GCI)® Control do communicate. Go to "Final Actions" on page 2-18.

2.33 Scale/Graphical Caregiver Interface (GCI)® Control—Calibration Error Troubleshooting

1. At the end of calibration, the scale checks several error conditions. If the load beam wires are connected into the wrong connector, or the load beam response does not track the calibration weight, errors are generated. The following table shows the possible error codes returned instead of the coefficients (see table 2-17 on page 2-198)).

Table 2-17. Calibration Error Codes

Error Codes	Description
1	Beam readings are not valid.
2	Zero readings not valid.
4	Max reading for weight on right foot incorrect.
5	Max reading for weight on left foot incorrect.
6	Max reading for weight on left head incorrect.
7	Max reading for weight on right head incorrect.
20	Matrix calculation error.
21	Coefficient range error.

2. Possible errors are a load beam not responding, calibration weight placed in the wrong position (weight was placed above the left head load beam instead of the right head load beam), beam wires connected into the wrong connector, or a scale board failure (refer to procedure 4.50).

2.34 Load Beam—Shorted Excitation Voltage

1. Use diagnostics to read the A/D readings. See “Diagnostics” on page 2-195.

All 4 channels display a value of 255, or a very high value (count).

Yes **No**
↓ → Go to step 3.

2. One of the load beams may have the - 5V shorted out to ground. See “Load Beam Shorted Excitation Voltage Tests” on page 2-200.
3. All 4 channels display a value of 0, or a very low value (count).

   Yes **No**
   ↓ → Go to “Final Actions” on page 2-18.

4. One of the load beams may have the + 5V shorted out to ground. See “Load Beam Shorted Excitation Voltage Tests” on page 2-200.

Load Beam Shorted Excitation Voltage Tests

Below are three tests to find a shorted excitation voltage in a load beam. Before performing any of the tests, make sure the load beams are connected (electrically).

Test 1

1. Using a voltmeter, check for a shorted load beam as follows (see figure 3-1 on page 3-7) and (see figure 3-2 on page 3-7):
   a. Measure the voltage from the scale board cover to the black wire beam connector. The black wire, pin 2, should measure - 4.75V to - 5.25V.
   b. Measure the voltage from the scale board cover to the red wire beam connector. The red wire, pin 5, should measure 4.75V to 5.25V.
2. If the voltages are not in those ranges, disconnect the load beams, one at a time, until the voltage changes to the proper value. The last beam disconnected is the shorted beam.

Test 2

Using the diagnostic commands to monitor the A/D readings, check for a shorted load beam as follows (see “Diagnostics” on page 2-195):

1. Disconnect the load beams, one at a time, and monitor the A/D readings.
2. When the A/D readings change to a reasonable value, the last load beam you disconnected is the one with the short. The load beam that is disconnected will give erroneous A/D readings.

Test 3

If the problem is intermittent, use a megameter to check for a shorted load beam as follows:

1. Disconnect the load beam from the scale board.
2. Connect the megameter to the bed frame.
3. Connect the other side of the megameter to one of the load beam wires (red, black, white, or green). The resistance should measure more than 5000 MegaΩ.

Test 4

1. To test a load beam that is not mounted in the bed, connect the megameter to the load beam body instead of to the bed frame.The resistance should measure more than 5000 MegaΩ.

2.35 Hydraulic System Malfunction

1. With the bed system in a low position, the hydraulic pump motor turns on when the **Bed Up** arrow control is pressed.

   Yes **No**
   ↓ → Verify that the hilow hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

2. The hydraulic hoses function properly.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched. Torque/replace the hydraulic fittings, only if leaking.

3. The valves function properly.

   Yes **No**
   ↓ → Replace the damaged valves. See “Hydraulic Valve” on page 4-91.

4. The system functions properly.

   Yes **No**
   ↓ → If only the head end operates upward, check hydraulic valve coil #13. (If only the foot end operates upward, check hydraulic valve coil #15).

5. The system functions properly.

   Yes **No**
   ↓ → See RAP 2.12 for additional troubleshooting techniques.

6. When the **Chair** control is pressed the bed system articulates into the chair position.

   Yes **No**
   ↓ → Verify the brake is set and the hydraulic valve coils are operating properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

7. The hydraulic hoses function properly.

   Yes **No**
   ↓ → Check that the hydraulic hoses are not kinked or pinched. Torque/replace the hydraulic fittings, only if leaking.

8. The valves function properly.

   Yes **No**
   ↓ → Replace any damaged valves. See “Hydraulic Valve” on page 4-91.

9. The system functions properly.

Yes **No**
↓ → See RAP 2.13 for additional troubleshooting techniques.

10. With the sleep surface flat, alternately press the **Foot Adjust** arrow controls. The foot section length extends and retracts.

Yes **No**
↓ → Verify the hydraulic motor turns on. See “Hydraulic Manifold Valve Coil” on page 4-89.

11. The hydraulic hoses function properly.

Yes **No**
↓ → Check that hydraulic hoses are not kinked or pinched. Re-torque/replace the hydraulic fittings that leak. Replace any damaged valves.

12. The hydraulic valve functions properly.

Yes **No**
↓ → See “Hydraulic Valve” on page 4-91 and “Retracting Foot Hydraulic Cylinder” on page 4-119.

13. Articulate the **Knee Up/Down, Head Up/Down, and Foot Up/Down** arrow controls. All functions articulate.

Yes **No**
↓ → Verify the bed system can be articulated using the opposite siderail functions.

14. The hydraulic pump motor functions properly.

Yes **No**
↓ → Verify that the hydraulic pump motor operates. See “Hydraulic Power Unit (P1900A and P1900B Models Only)” on page 4-94 or “Hydraulic System Oil Fill” on page 4-87.

15. The hydraulic hoses functions properly.

Yes **No**
↓ → Check for kinked or loose hydraulic hose fittings. See RAP 2.36.

16. The hydraulic valve coils function properly.

Yes **No**
↓ → Verify that the hydraulic valve coils are functioning properly. See “Hydraulic Manifold Valve Coil” on page 4-89.

17. The hydraulic cylinders function properly.

Yes **No**
↓ → Verify the hydraulic cylinders are in alignment and properly attached. See “Hilow Foot Hydraulic Cylinder” on page 4-103, “Hilow Head Hydraulic Cylinder” on page 4-107 and “Knee Hydraulic Cylinder” on page 4-115.

18. Go to “Final Actions” on page 2-18.

2.36 Hydraulic Fluid Leak

1. Visible hydraulic fluid found on fitting or hose.

   Yes **No**
   ↓ → Check all hydraulic hoses, fittings, cylinders, and hydraulic manifold for leaks. Torque the hydraulic fittings only if they are leaking fluid. Reference the torquing information found in the hydraulic sections of Chapter 4.

2. The hydraulic fluid level is up to the “B” level line inscribed on the side of the hydraulic fluid reservoir. See “Hydraulic System Oil Fill” on page 4-87.

3. The TotalCare® Bed System bed does not drift downward. There is no visible sign of a leak.

   Yes **No**
   ↓ → Verify that the hilow hydraulic valves are seating. See “Hydraulic Valve” on page 4-91.

4. Go to “Final Actions” on page 2-18.

2.37 Maximum Inflate Malfunction

1. With the blower motor operating, press the **Max-inflate** control on the left-hand caregiver siderail. The blower speed increases to its maximum rpm and all mattress zones inflate to their maximum pressure of 25" H_2O (47 mm Hg).

   Yes **No**
   ↓ → Verify that blower motor voltage is at least 115V AC.

2. Check all air lines for kinks and proper connections. Check complete mattress surfaces for leaks. If problem persists:

   Verify there are no function lockouts applied. If not, replace the suspected caregiver surface control panel P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67.

3. Go to “Final Actions” on page 2-18.

2.38 Treatment Surface Air Bladders Malfunction

1. With the TotalCare® Bed System in the flat position, all air bladders are inflated.

   Yes **No**
   ↓ → Go to step 3.

2. Go to “Final Actions” on page 2-18.

3. The filter intake for dirt or other obstructions. Filter is free of dirt and other obstructions. See “Low Noise Blower Assembly” on page 4-187.

   Yes **No**
   ↓ → Clean filter and/or clear obstructions.

4. The air supply hose has no obstructions/kinks and has proper connections at the air module and air bladders. Air supply hoses check good.

   Yes **No**
   ↓ → Clean the air hose obstruction and proper connection at air module and cushions.

5. Inspect for damaged bladders in the air module. All bladders check good.

   Yes **No**
   ↓ → Replace damaged air module.

6. Go to “Final Actions” on page 2-18.

2.39 Loss of Therapy During Transport

NOTE:
The following information is provided as a guide to ensure the continuation of therapy during transport.

1. The TotalCare® Bed System battery is fully charged.

   Yes **No**
   ↓ → Replace the low charged battery with a properly charged battery.

WARNING:
A ventilator supports life for most patients. Ventilators have alarms that normally sound when a ventilator is disconnected. A disconnected ventilator must immediately be reconnected. Damage to equipment or personal injury can occur.

2. All peripheral treatment and life support equipment are properly stowed and ready for transport.

   Yes **No**
   ↓ → Ventilators and other life support devices, such devices include: External and internal pacemakers, internal automatic defibrillator, emergency defibrillator, and IV pump. Ensure the manufacturers' and caregiver recommendations are followed. Ensure adequate personnel are available for transport.

3. There is no electrical interference.

   Yes **No**
   ↓ → The treatment surface is designed not to emit electrical energy that interferes with the performance of devices at the bedside. If there is interference contact authorized Hill-Rom service representative for assistance.

4. Ready for transport, go to "Final Actions" on page 2-18.

2.40 Local Operating Network (LON) Communication Fault

1. The TotalCare® Bed System is fully operational and there are no LON service requests or LON failure symptoms.

   Yes **No**
   ↓ → Inspect all interconnecting cables for opens, shorts, and improper connections.

2. There are no blown electrical power fuses.

   Yes **No**
   ↓ → Using a voltmeter, find blown electrical fuses. See “Power Control Module P.C. Board” on page 4-150.

3. The battery is fully charged.

   Yes **No**
   ↓ → Using a voltmeter, recharge the battery. See “Battery” on page 4-145.

4. Using the **Chair** control, the bed system articulates into the chair position.

   Yes **No**
   ↓ → Any malfunction indicates that the P.C. board needs to be replaced. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67. (For troubleshooting purposes, remove the caregiver control P.C. board from the siderail on the opposite side of the bed. Only like P.C. function boards may be used for this purpose. Return the P.C. boards to their original positions.)

5. The position sensors function properly.

   Yes **No**
   ↓ → Calibrate all position sensors. See “Articulation Position Sensing System Calibration” on page 4-11.

6. The caregiver control panel functions properly

   Yes **No.**
   ↓ → Troubleshoot the main caregiver control panel positioning P.C. board in the intermediate siderail. See “Main Caregiver P.C. Board or Patient Control Switch P.C. Board” on page 4-67, “Weigh Frame Junction P.C. Board” on page 4-159, “Scale Control—Patient Exit Detection (PED) Module” on page 4-163 and “Weigh Frame Junction P.C. Board” on page 4-159.

7. Go to “Final Actions” on page 2-18.

2.41 Air Manifold Malfunction

1. The foot treatment surface functions properly.

Yes **No**
↓ → Verify the foot mattress hoses are properly connected. Ensure there are no kinked air hoses. Check for fault codes. Check foot mattress bladders for gross leaks. Verify the foot surface treatment module is functioning. See “Air Module—Manifold Assembly” on page 4-193. Verify all position sensors are functioning properly. See “Articulation Position Sensing System Calibration” on page 4-11.

2. Place the TotalCare® Bed System in the flat position, with the foot section fully extended. All foot mattress bladders are fully inflated.

Yes **No**
↓ → Verify the blower motor is operating and the bed system is flat and extended. Verify the surface treatment module is functioning. See “Air Module—Manifold Assembly” on page 4-193.

3. Retract the foot section. The alternate foot bladders deflate.

Yes **No**
↓ → Verify the foot mattress hoses are properly connected. Ensure there are no kinked air hoses. Check for fault codes. Verify all position sensors are functioning properly. See “Articulation Position Sensing System Calibration” on page 4-11 and “Short Stay Surface” on page 4-206.

4. Place the system in the chair position. The foot mattress bladders are fully deflated.

Yes **No**
↓ → Ensure there are no kinked air hoses. Check for fault codes. Verify the surface treatment module is functioning. See “Air Module—Manifold Assembly” on page 4-193. Verify all position sensors are functioning properly. See “Articulation Position Sensing System Calibration” on page 4-11.

5. The surface mattress inflates and deflates properly.

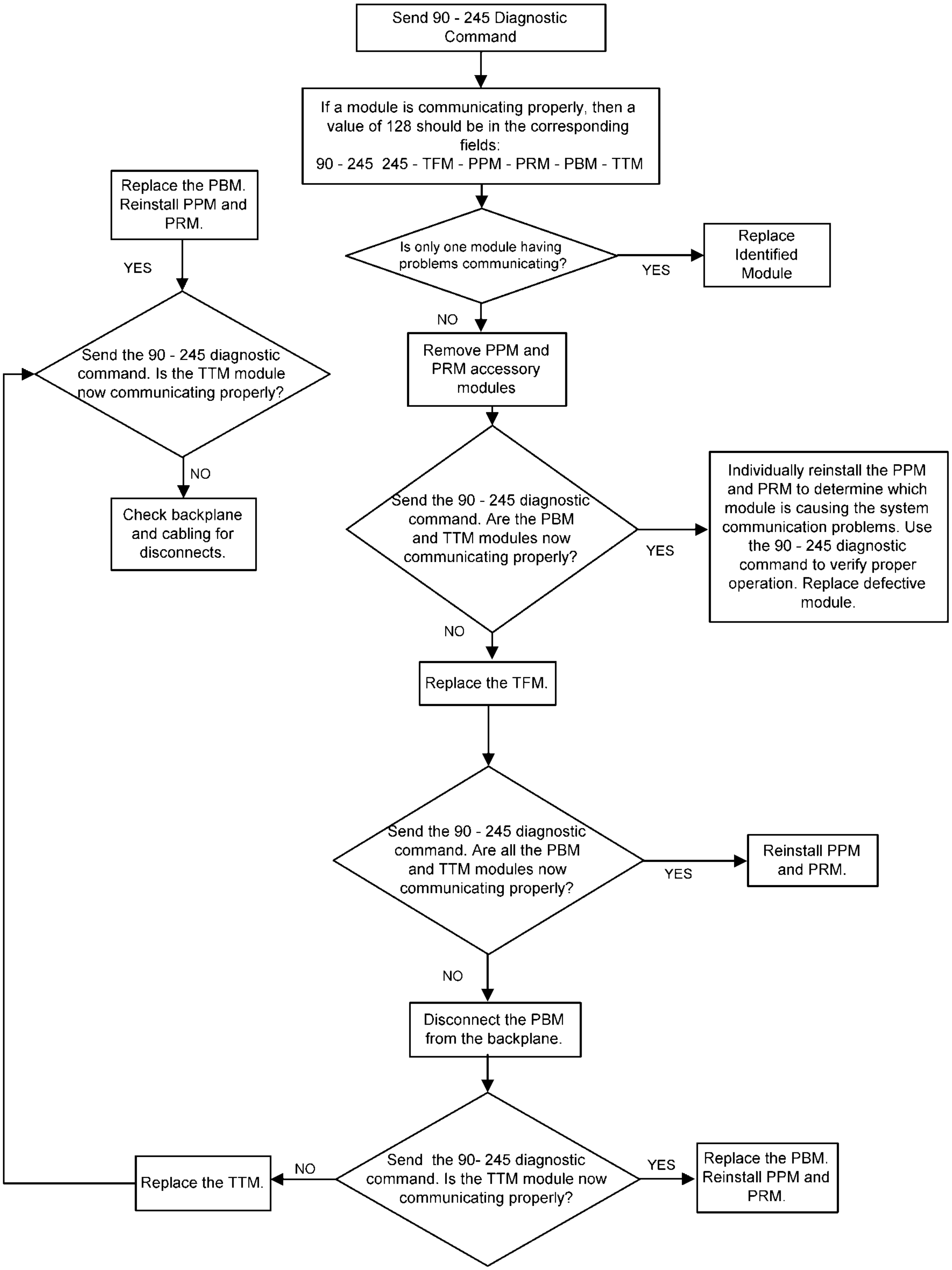
Yes **No**
↓ → Verify all mattress hoses are properly connected. Ensure there are no kinked air hoses. Check for fault codes. Check mattress for gross leaks. Verify the surface treatment module is functioning. See “Air Module—Manifold Assembly” on page 4-193.

6. Place the bed system in the chair position. The head and thigh are partially deflated.

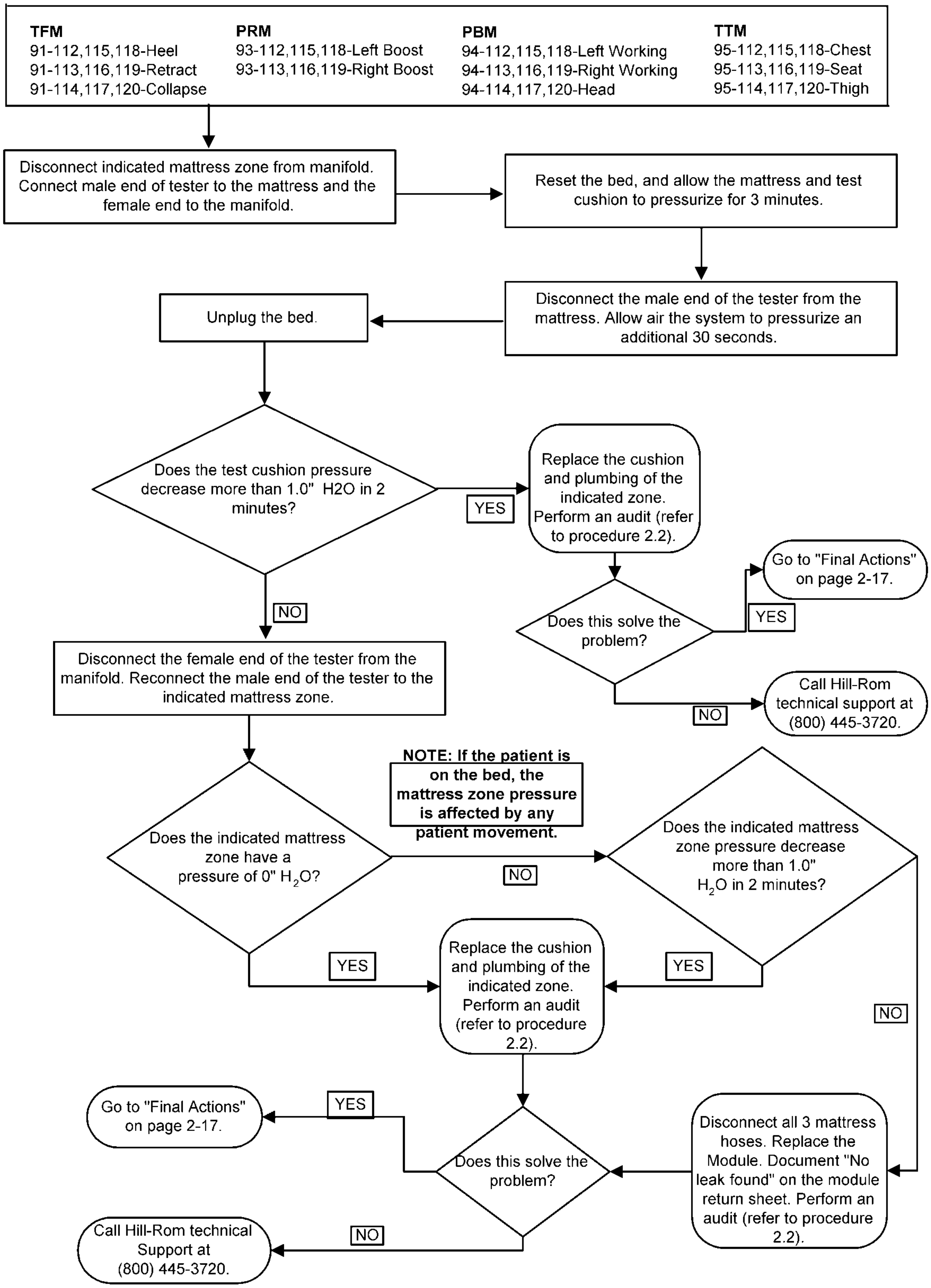
Yes **No**
↓ → Verify all mattress hoses are properly connected. Ensure there are no kinked air hoses. Check for fault codes. Verify the surface treatment module is functioning. See “Air Module—Manifold Assembly” on page 4-193. Verify all position sensors are functioning properly. See “Articulation Position Sensing System Calibration” on page 4-11.

7. Go to “Final Actions” on page 2-18.

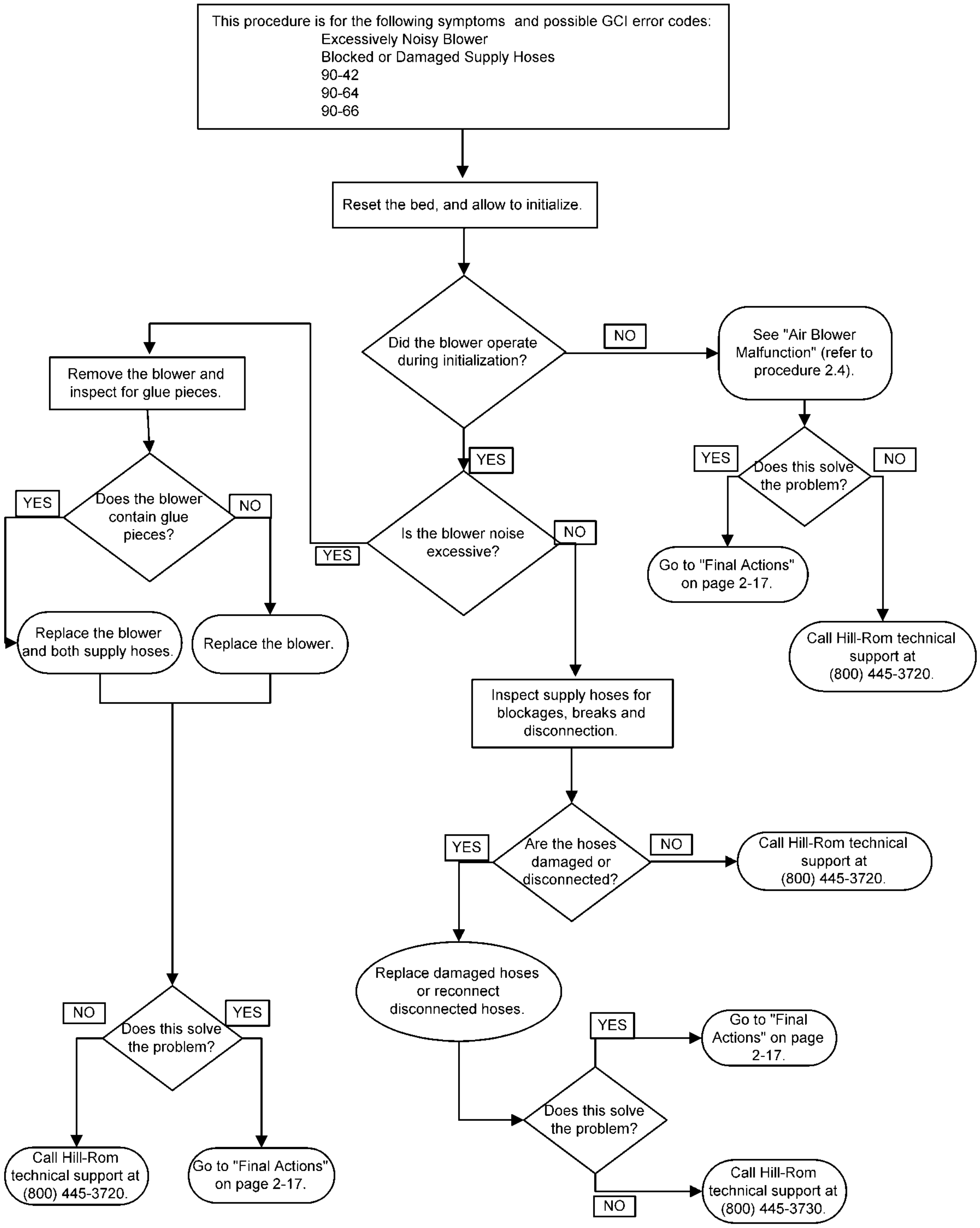
2.42 Pulmonary Module Communication Failures


Send 90 - 245 Diagnostic Command
If a module is communicating properly, then a value of 128 should be in the corresponding fields:
90 - 245 245 - TFM - PPM - PRM - PBM - TTM
Is only one module having problems communicating?
YES
Replace Identified Module
NO
Remove PPM and PRM accessory modules
Send the 90 - 245 diagnostic command. Are the PBM and TTM modules now communicating properly?
YES
Individually reinstall the PPM and PRM to determine which module is causing the system communication problems. Use the 90 - 245 diagnostic command to verify proper operation. Replace defective module.
NO
Replace the TFM.
Send the 90 - 245 diagnostic command. Are all the PBM and TTM modules now communicating properly?
YES
Reinstall PPM and PRM.
NO
Disconnect the PBM from the backplane.
Send the 90- 245 diagnostic command. Is the TTM module now communicating properly?
YES
Replace the PBM. Reinstall PPM and PRM.
NO
Replace the TTM.
Send the 90 - 245 diagnostic command. Is the TTM module now communicating properly?
YES
Replace the PBM. Reinstall PPM and PRM.
NO
Check backplane and cabling for disconnects.

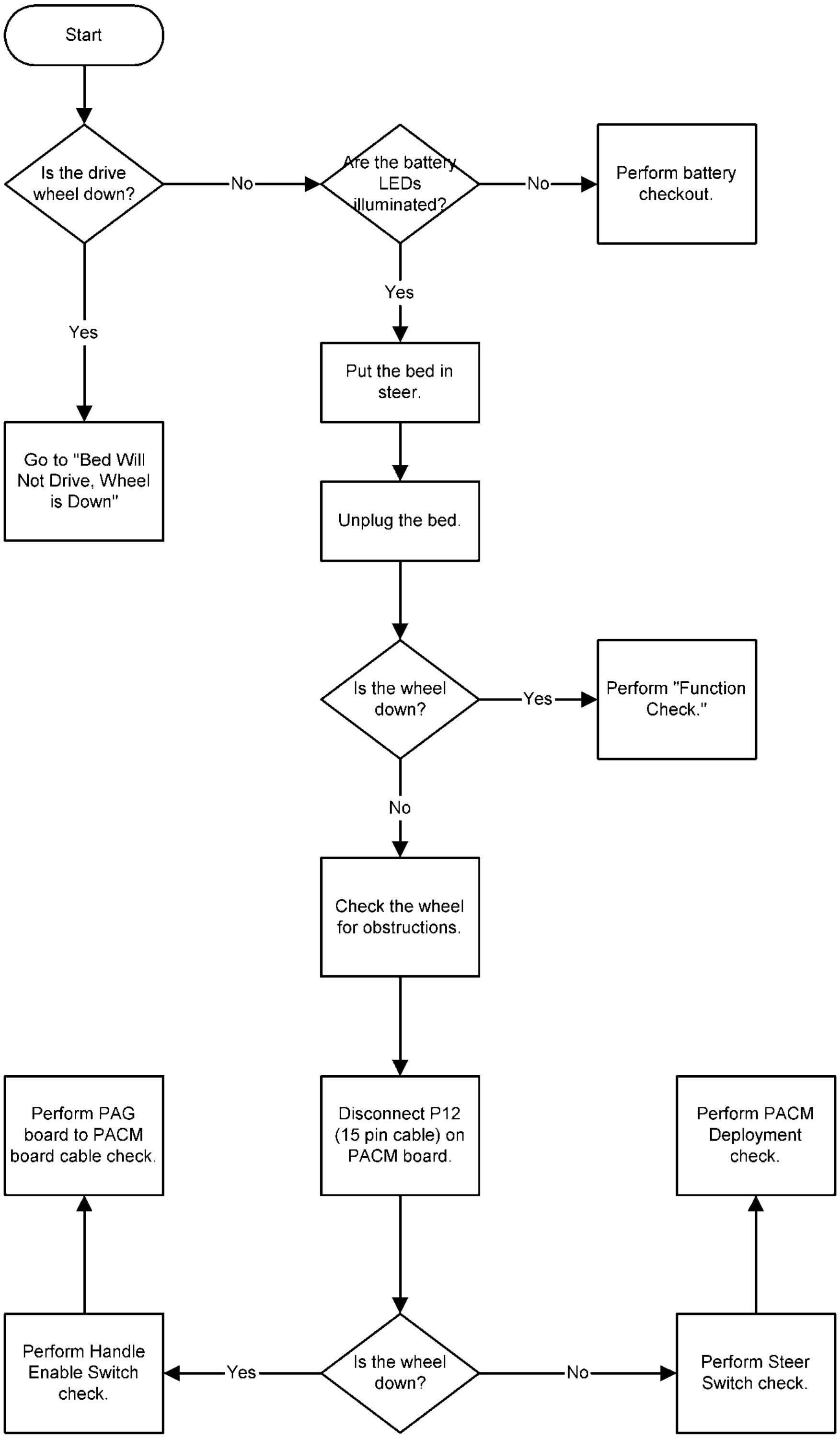
2.43 Pulmonary Surface Pressure Failures (P1900D Model)


TFM
91-112,115,118-Heel
91-113,116,119-Retract
91-114,117,120-Collapse
PRM
93-112,115,118-Left Boost
93-113,116,119-Right Boost
PBM
94-112,115,118-Left Working
94-113,116,119-Right Working
94-114,117,120-Head
TTM
95-112,115,118-Chest
95-113,116,119-Seat
95-114,117,120-Thigh
Disconnect indicated mattress zone from manifold. Connect male end of tester to the mattress and the female end to the manifold.
Reset the bed, and allow the mattress and test cushion to pressurize for 3 minutes.
Disconnect the male end of the tester from the mattress. Allow air the system to pressurize an additional 30 seconds.
Unplug the bed.
Does the test cushion pressure decrease more than 1.0" H2O in 2 minutes?
YES
Replace the cushion and plumbing of the indicated zone. Perform an audit (refer to procedure 2.2).
Does this solve the problem?
YES
Go to "Final Actions" on page 2-17.
NO
Call Hill-Rom technical support at (800) 445-3720.
NO
Disconnect the female end of the tester from the manifold. Reconnect the male end of the tester to the indicated mattress zone.
NOTE: If the patient is on the bed, the mattress zone pressure is affected by any patient movement.
Does the indicated mattress zone have a pressure of 0" H₂O?
NO
Does the indicated mattress zone pressure decrease more than 1.0" H₂O in 2 minutes?
YES
YES
Replace the cushion and plumbing of the indicated zone. Perform an audit (refer to procedure 2.2).
NO
Disconnect all 3 mattress hoses. Replace the Module. Document "No leak found" on the module return sheet. Perform an audit (refer to procedure 2.2).
Does this solve the problem?
YES
Go to "Final Actions" on page 2-17.
NO
Call Hill-Rom technical Support at (800) 445-3720.

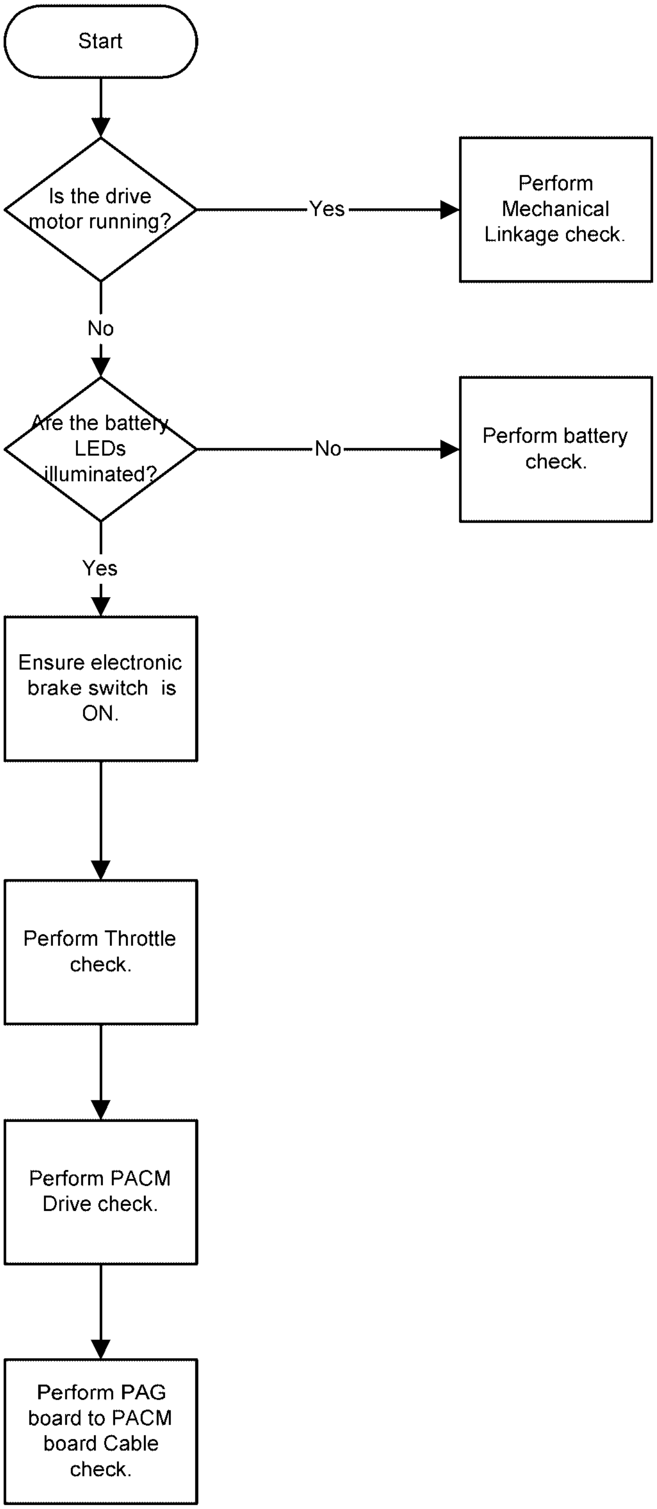
2.44 Blower/Supply Hose Failures (P1900D Model Only)


This procedure is for the following symptoms and possible GCI error codes:
Excessively Noisy Blower
Blocked or Damaged Supply Hoses
90-42
90-64
90-66
Reset the bed, and allow to initialize.
Did the blower operate during initialization?
NO
See "Air Blower Malfunction" (refer to procedure 2.4).
YES
Does this solve the problem?
NO
Go to "Final Actions" on page 2-17.
Call Hill-Rom technical support at (800) 445-3720.
YES
Is the blower noise excessive?
YES
NO
Remove the blower and inspect for glue pieces.
YES
Does the blower contain glue pieces?
NO
Replace the blower and both supply hoses.
Replace the blower.
Inspect supply hoses for blockages, breaks and disconnection.
YES
Are the hoses damaged or disconnected?
NO
Call Hill-Rom technical support at (800) 445-3720.
Replace damaged hoses or reconnect disconnected hoses.
NO
Does this solve the problem?
YES
Call Hill-Rom technical support at (800) 445-3720.
Go to "Final Actions" on page 2-17.
YES
Go to "Final Actions" on page 2-17.
Does this solve the problem?
NO
Call Hill-Rom technical support at (800) 445-3730.

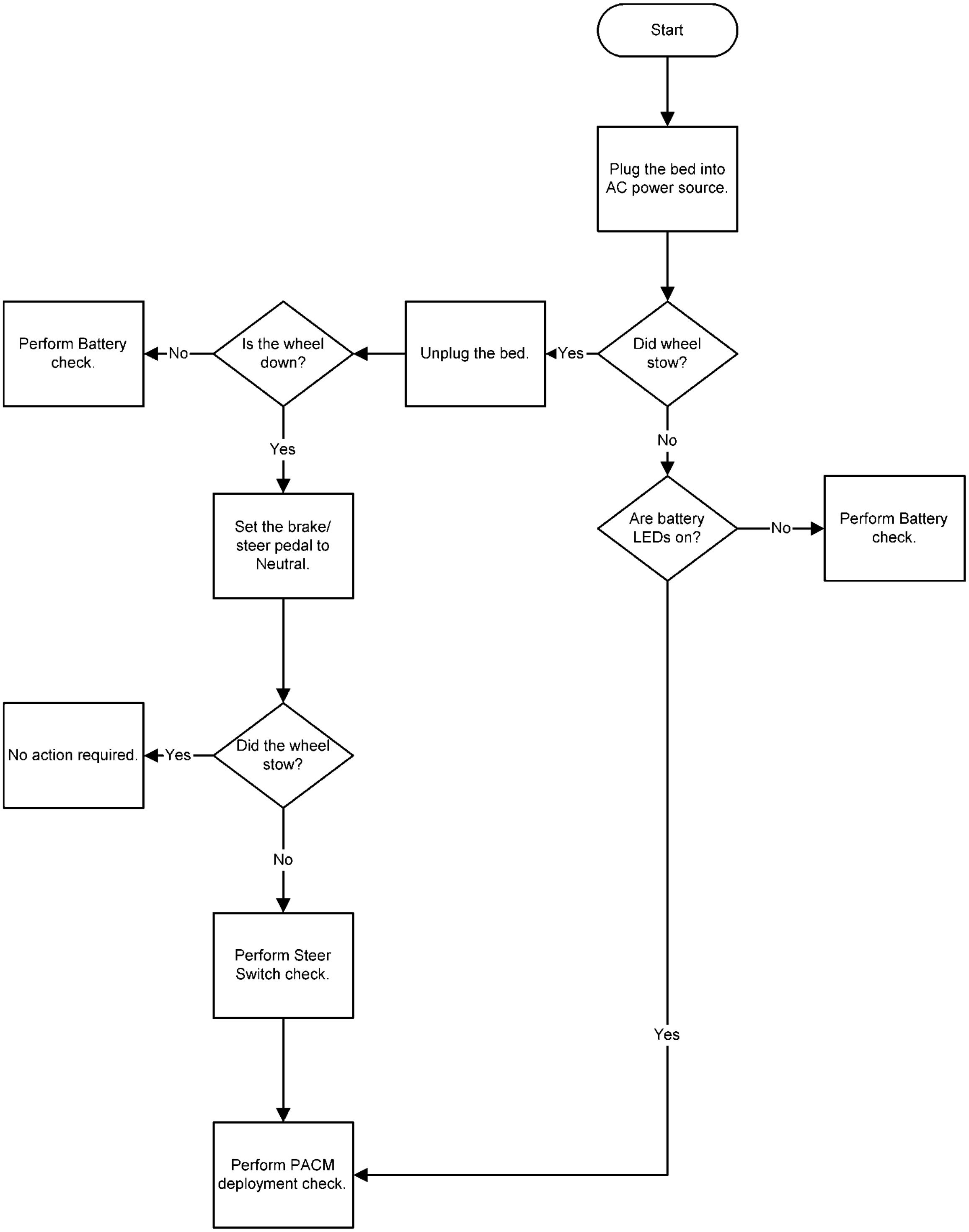
2.45 Bed Will Not Drive (IntelliDrive® Transport System)


Start
Is the drive wheel down?
No
Are the battery LEDs illuminated?
No
Perform battery checkout.
Yes
Yes
Go to "Bed Will Not Drive, Wheel is Down"
Put the bed in steer.
Unplug the bed.
Is the wheel down?
Yes
Perform "Function Check."
No
Check the wheel for obstructions.
Perform PAG board to PACM board cable check.
Disconnect P12 (15 pin cable) on PACM board.
Perform PACM Deployment check.
Perform Handle Enable Switch check.
Yes
Is the wheel down?
No
Perform Steer Switch check.

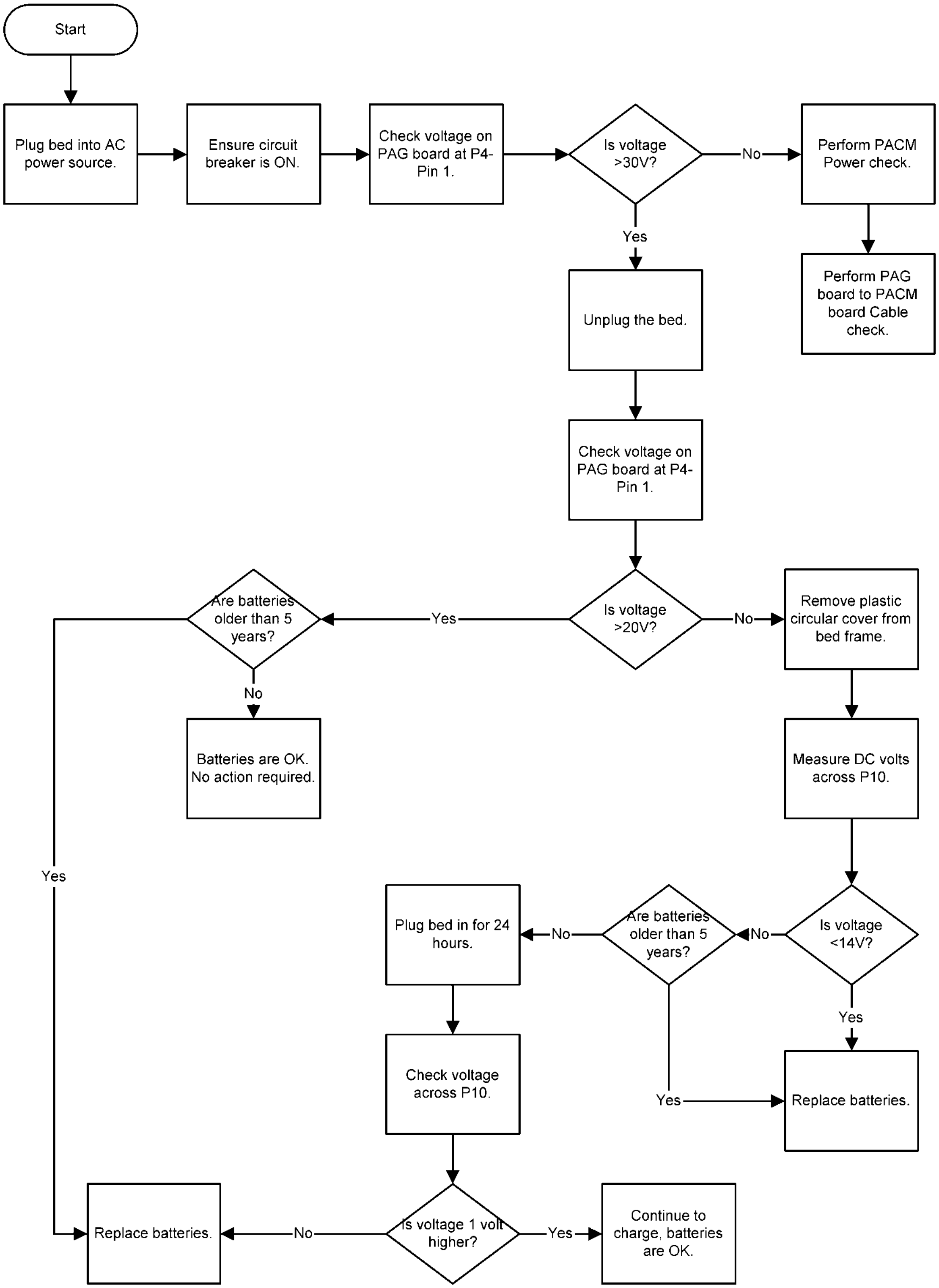
2.46 Bed Will Not Drive, Wheel Is Down (IntelliDrive® Transport System)


Start
Is the drive motor running?
Yes
Perform Mechanical Linkage check.
No
Are the battery LEDs illuminated?
No
Perform battery check.
Yes
Ensure electronic brake switch is ON.
Perform Throttle check.
Perform PACM Drive check.
Perform PAG board to PACM board Cable check.

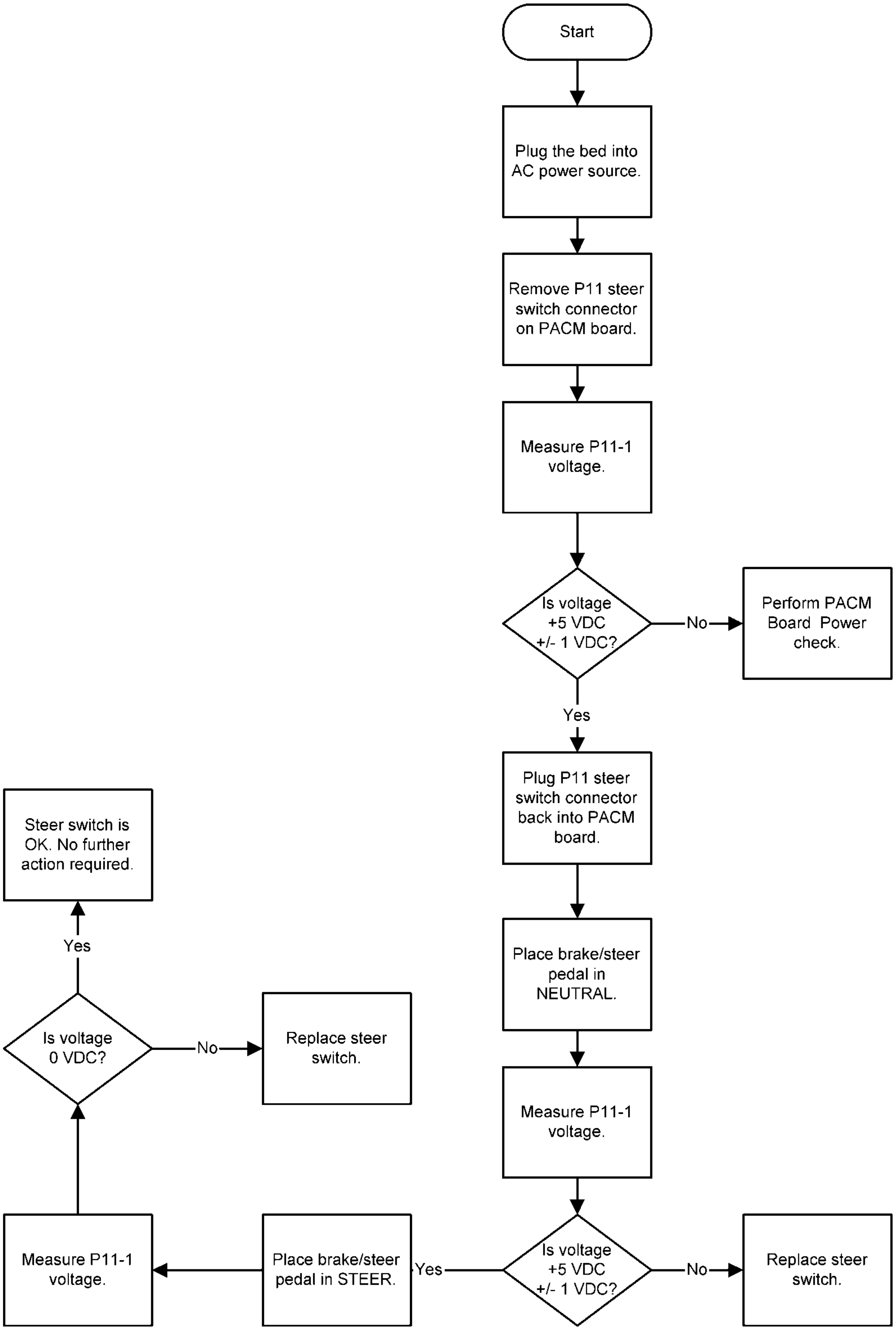
2.47 Wheel Will Not Stow (IntelliDrive® Transport System)


Start
Plug the bed into AC power source.
Did wheel stow?
Yes
Unplug the bed.
Is the wheel down?
No
Perform Battery check.
Yes
Set the brake/ steer pedal to Neutral.
Did the wheel stow?
Yes
No action required.
No
Perform Steer Switch check.
Perform PACM deployment check.
No
Are battery LEDs on?
No
Perform Battery check.
Yes

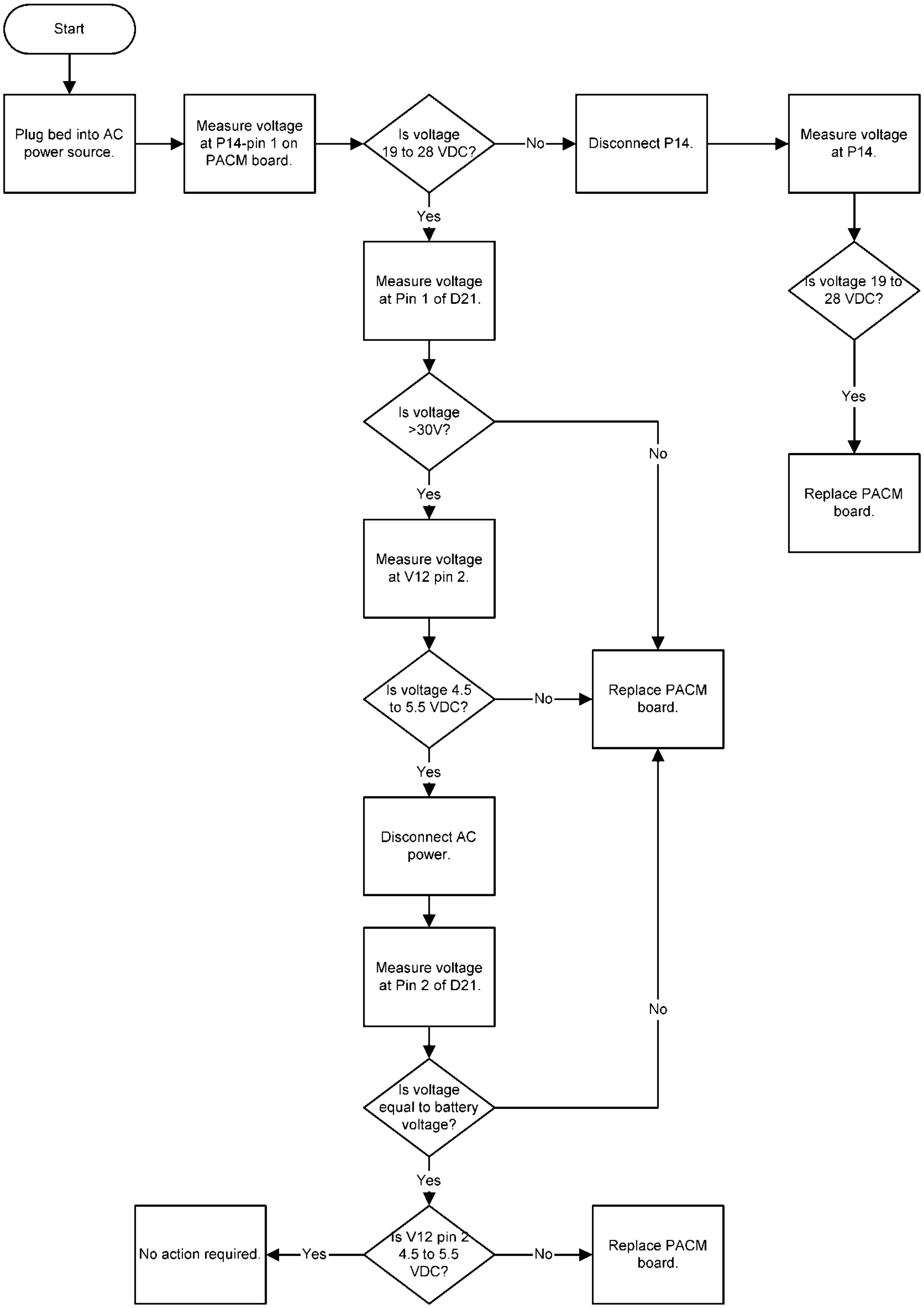
2.48 Battery Check (IntelliDrive® Transport System)


Start
Plug bed into AC power source.
Ensure circuit breaker is ON.
Check voltage on PAG board at P4-Pin 1.
Is voltage >30V?
No
Perform PACM Power check.
Perform PAG board to PACM board Cable check.
Yes
Unplug the bed.
Check voltage on PAG board at P4-Pin 1.
Is voltage >20V?
Yes
Are batteries older than 5 years?
No
Batteries are OK. No action required.
Yes
No
Remove plastic circular cover from bed frame.
Measure DC volts across P10.
Is voltage <14V?
No
Are batteries older than 5 years?
No
Plug bed in for 24 hours.
Yes
Replace batteries.
Yes
Check voltage across P10.
Is voltage 1 volt higher?
No
Replace batteries.
Yes
Continue to charge, batteries are OK.

2.49 Steer Switch Check (IntelliDrive® Transport System)

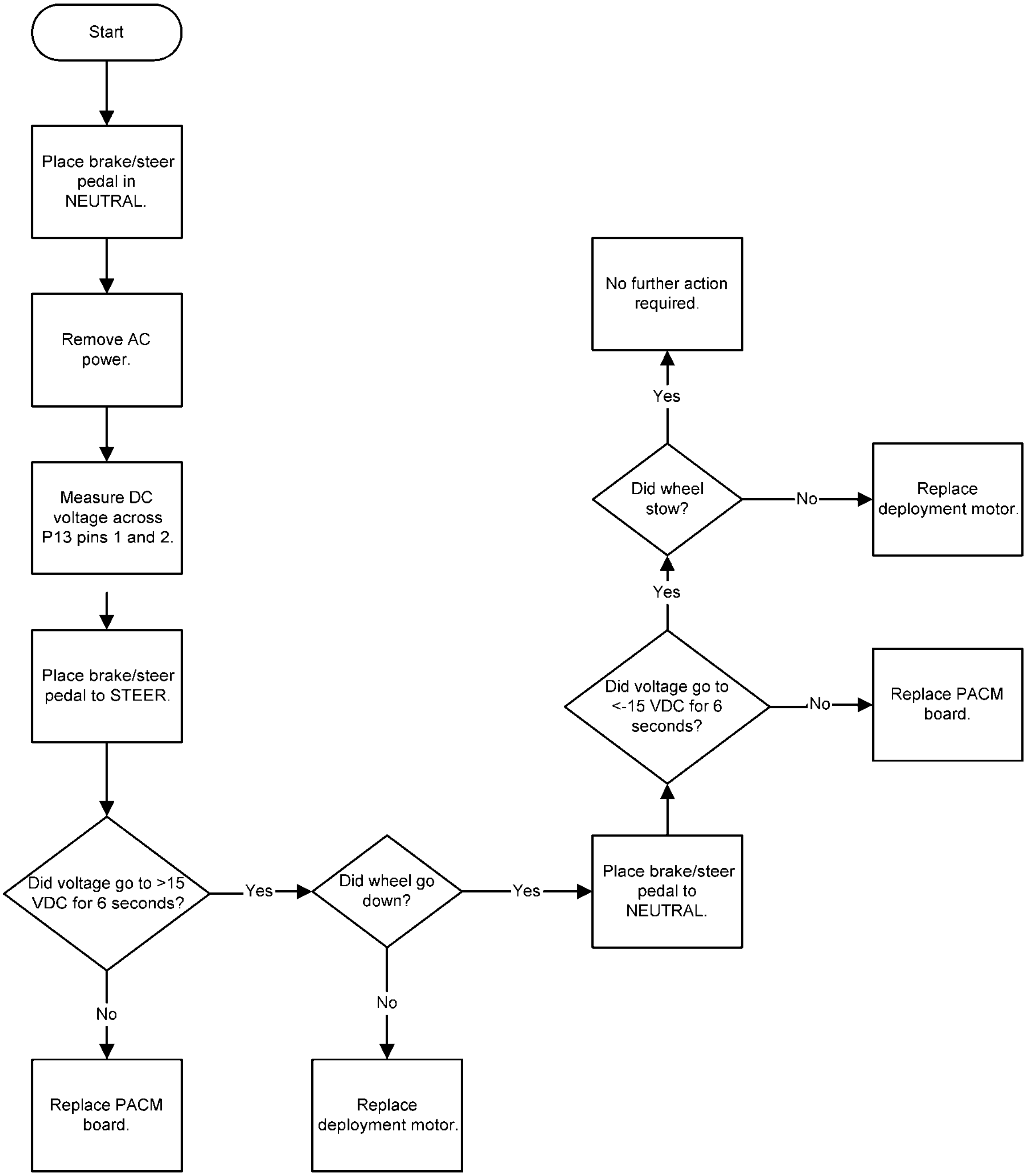

Start
Plug the bed into AC power source.
Remove P11 steer switch connector on PACM board.
Measure P11-1 voltage.
Is voltage +5 VDC +/- 1 VDC?
No
Perform PACM Board Power check.
Yes
Plug P11 steer switch connector back into PACM board.
Place brake/steer pedal in NEUTRAL.
Measure P11-1 voltage.
Is voltage +5 VDC +/- 1 VDC?
No
Replace steer switch.
Yes
Place brake/steer pedal in STEER.
Measure P11-1 voltage.
Is voltage 0 VDC?
No
Replace steer switch.
Yes
Steer switch is OK. No further action required.

2.50 PACM Board Power Check (IntelliDrive® Transport System)

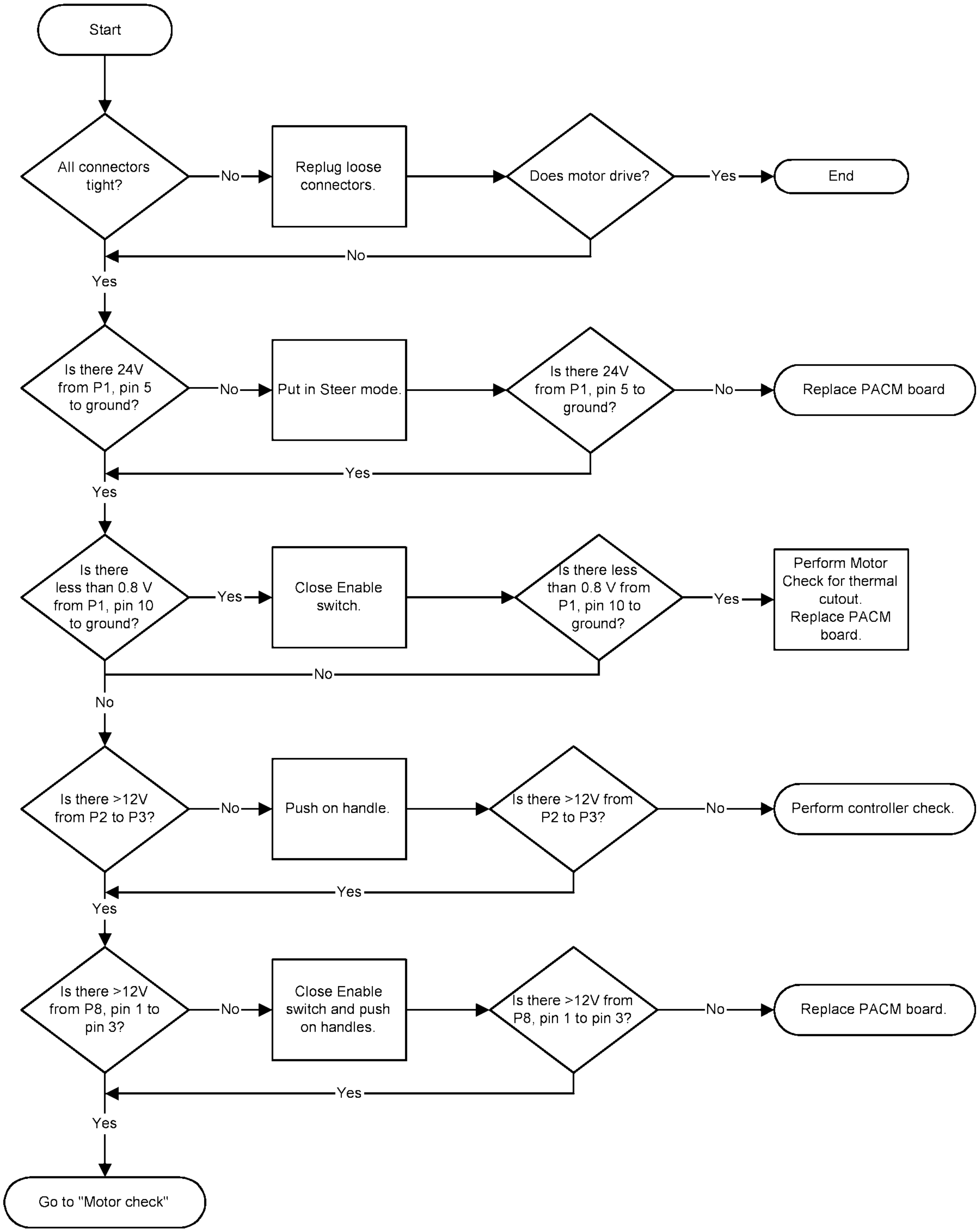

Start
Plug bed into AC power source.
Measure voltage at P14-pin 1 on PACM board.
Is voltage 19 to 28 VDC?
No
Disconnect P14.
Measure voltage at P14.
Is voltage 19 to 28 VDC?
Yes
Replace PACM board.
Yes
Measure voltage at Pin 1 of D21.
Is voltage >30V?
No
Yes
Measure voltage at V12 pin 2.
Is voltage 4.5 to 5.5 VDC?
No
Replace PACM board.
Yes
Disconnect AC power.
Measure voltage at Pin 2 of D21.
No
Is voltage equal to battery voltage?
Yes
No action required.
Yes
Is V12 pin 2 4.5 to 5.5 VDC?
No
Replace PACM board.

)

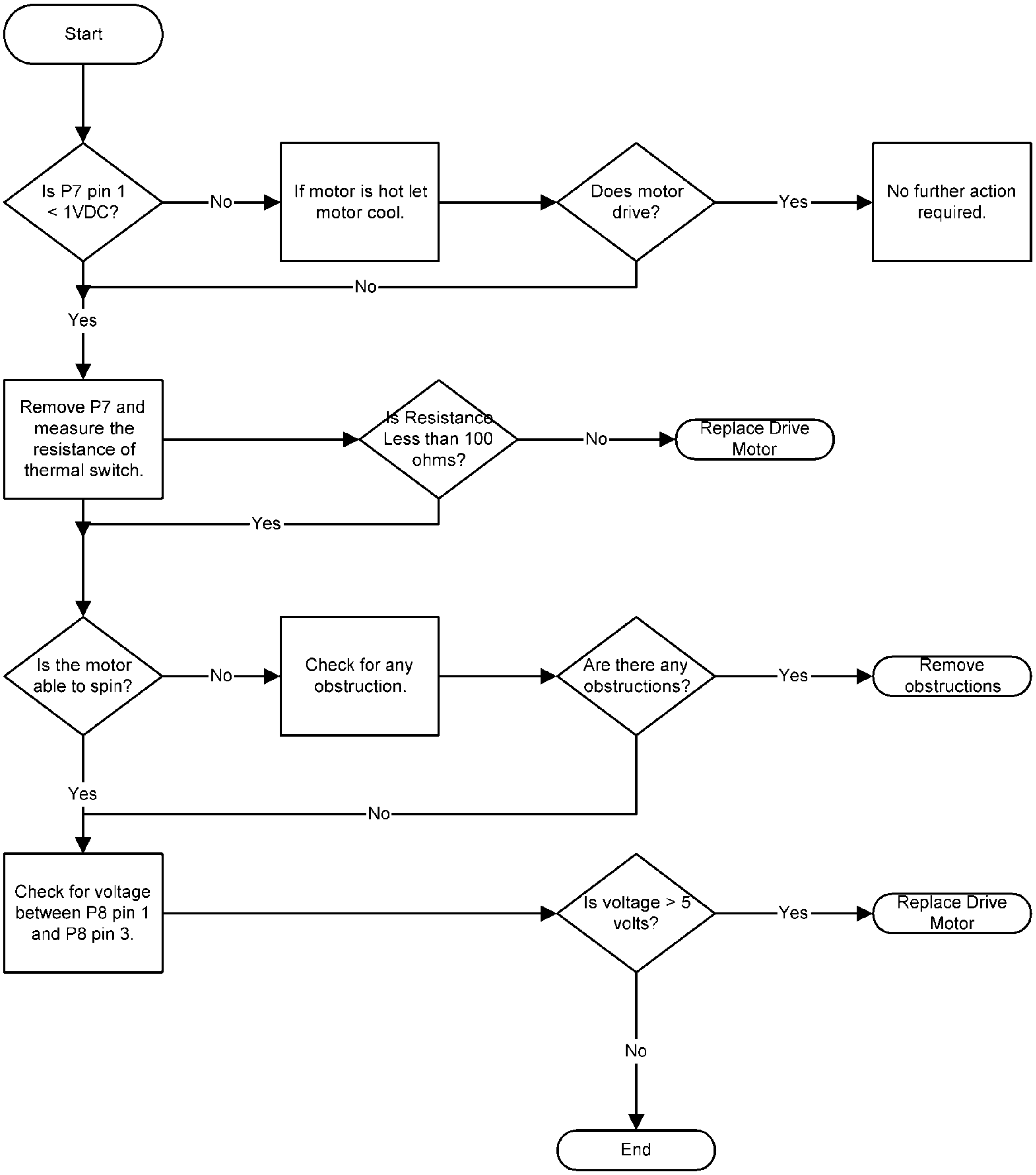
2.51 PACM Board Deployment Check (IntelliDrive® Transport System)


Start
Place brake/steer pedal in NEUTRAL.
Remove AC power.
Measure DC voltage across P13 pins 1 and 2.
Place brake/steer pedal to STEER.
Did voltage go to >15 VDC for 6 seconds?
No
Replace PACM board.
Yes
Did wheel go down?
No
Replace deployment motor.
Yes
Place brake/steer pedal to NEUTRAL.
Did voltage go to <-15 VDC for 6 seconds?
No
Replace PACM board.
Yes
Did wheel stow?
No
Replace deployment motor.
Yes
No further action required.

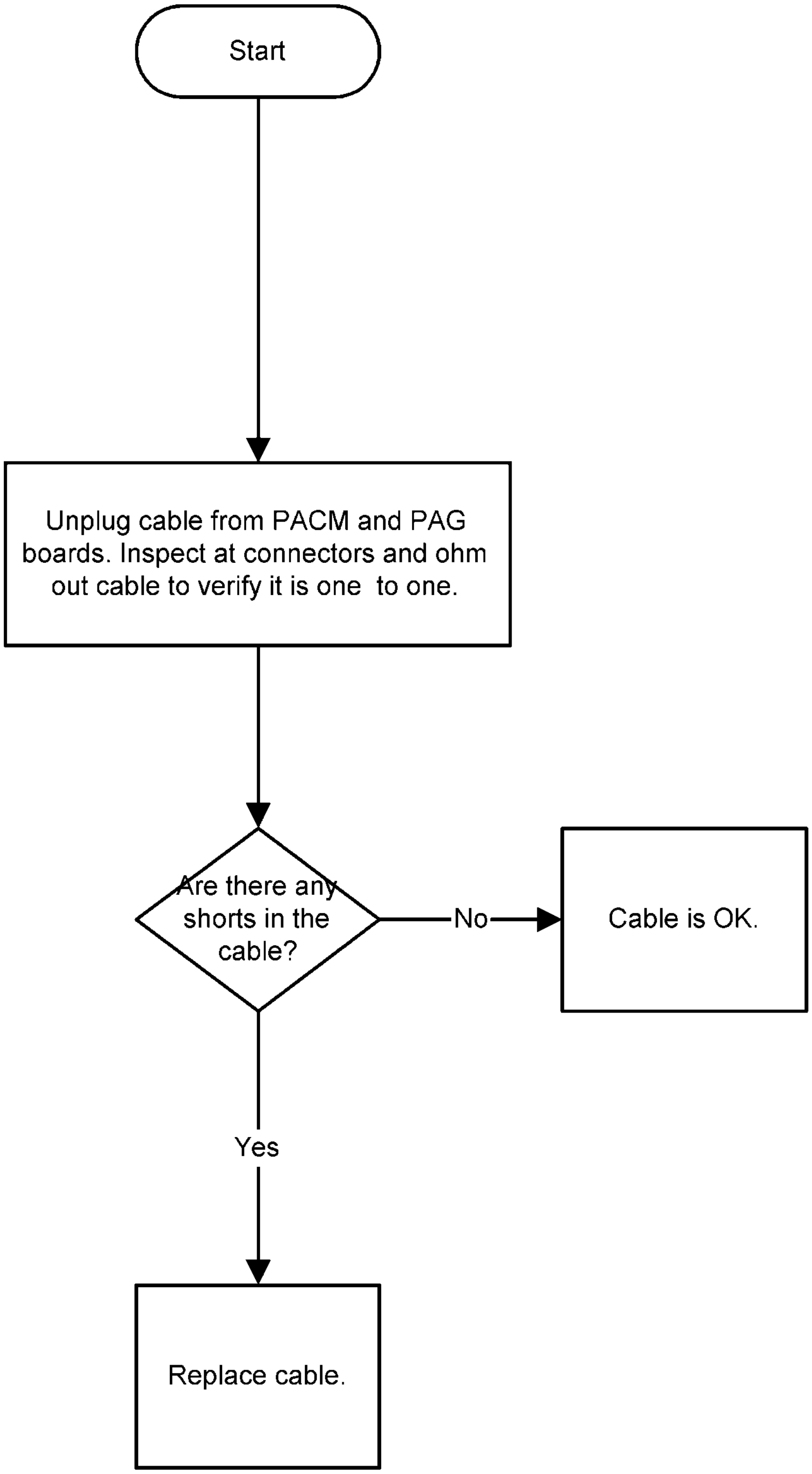
2.52 PACM Board Drive Check (IntelliDrive® Transport System)


Start
All connectors tight?
No
Replug loose connectors.
Does motor drive?
Yes
End
No
Yes
Is there 24V from P1, pin 5 to ground?
No
Put in Steer mode.
Is there 24V from P1, pin 5 to ground?
No
Replace PACM board
Yes
Yes
Is there less than 0.8 V from P1, pin 10 to ground?
Yes
Close Enable switch.
Is there less than 0.8 V from P1, pin 10 to ground?
Yes
Perform Motor Check for thermal cutout. Replace PACM board.
No
No
Is there >12V from P2 to P3?
No
Push on handle.
Is there >12V from P2 to P3?
No
Perform controller check.
Yes
Yes
Is there >12V from P8, pin 1 to pin 3?
No
Close Enable switch and push on handles.
Is there >12V from P8, pin 1 to pin 3?
No
Replace PACM board.
Yes
Yes
Go to "Motor check"

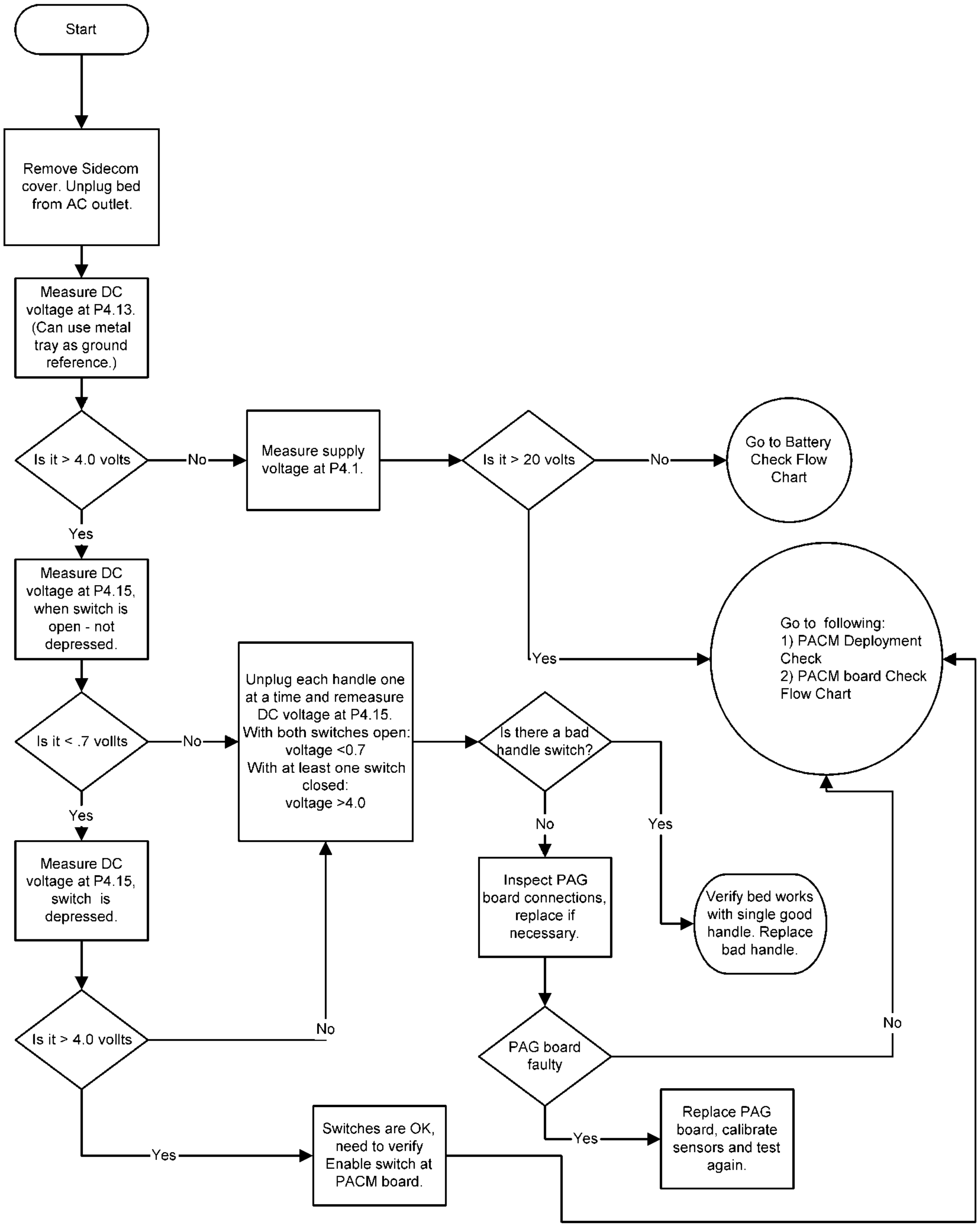
2.53 Motor Check (IntelliDrive® Transport System)


Start
Is P7 pin 1 < 1VDC?
No
If motor is hot let motor cool.
Does motor drive?
Yes
No further action required.
No
Yes
Remove P7 and measure the resistance of thermal switch.
Is Resistance Less than 100 ohms?
No
Replace Drive Motor
Yes
Is the motor able to spin?
No
Check for any obstruction.
Are there any obstructions?
Yes
Remove obstructions
Yes
No
Check for voltage between P8 pin 1 and P8 pin 3.
Is voltage > 5 volts?
Yes
Replace Drive Motor
No
End

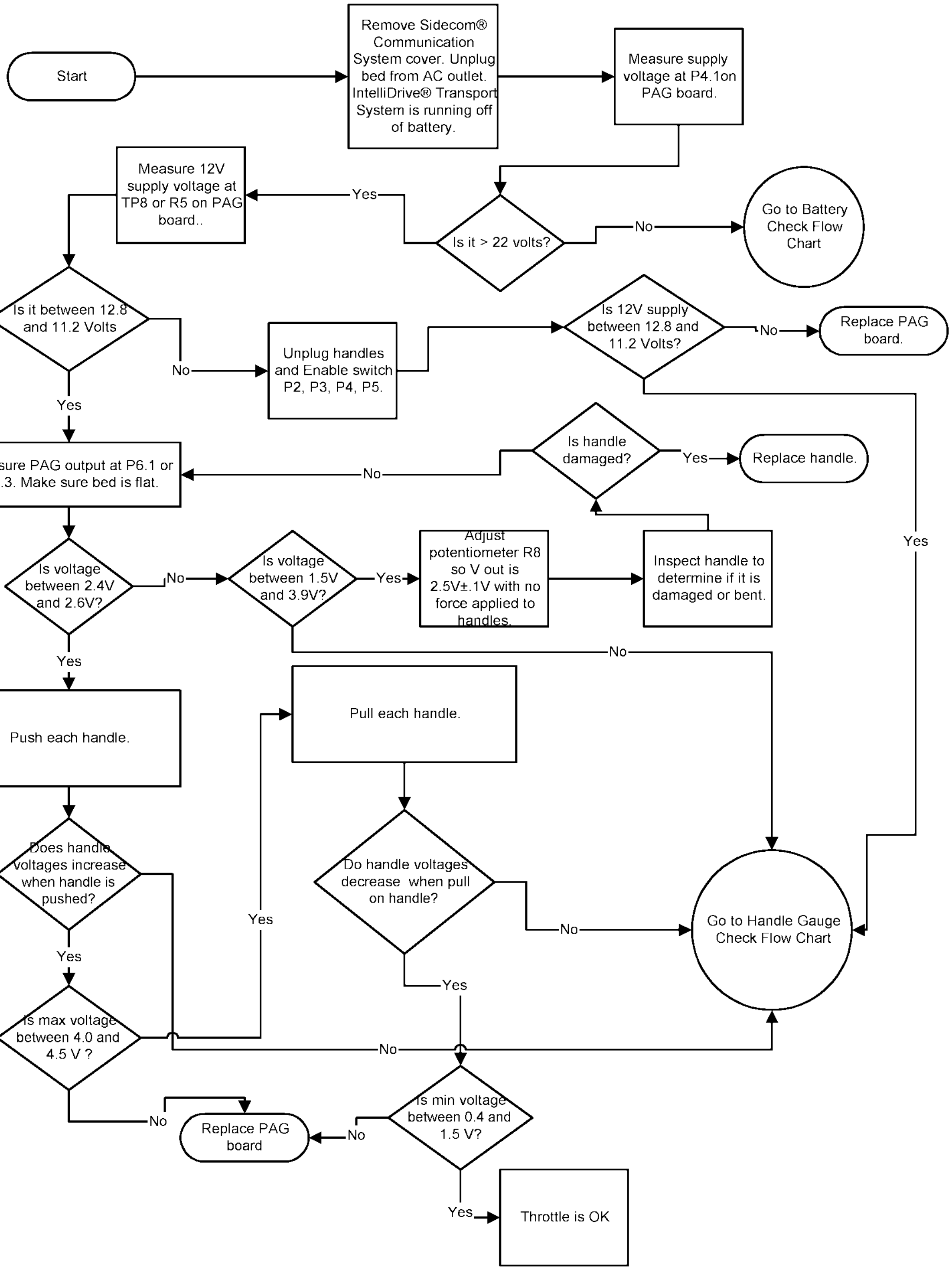
2.54 PACM to PAG Board Cable Check (IntelliDrive® Transport System)


Start
Unplug cable from PACM and PAG boards. Inspect at connectors and ohm out cable to verify it is one to one.
Are there any shorts in the cable?
No
Cable is OK.
Yes
Replace cable.

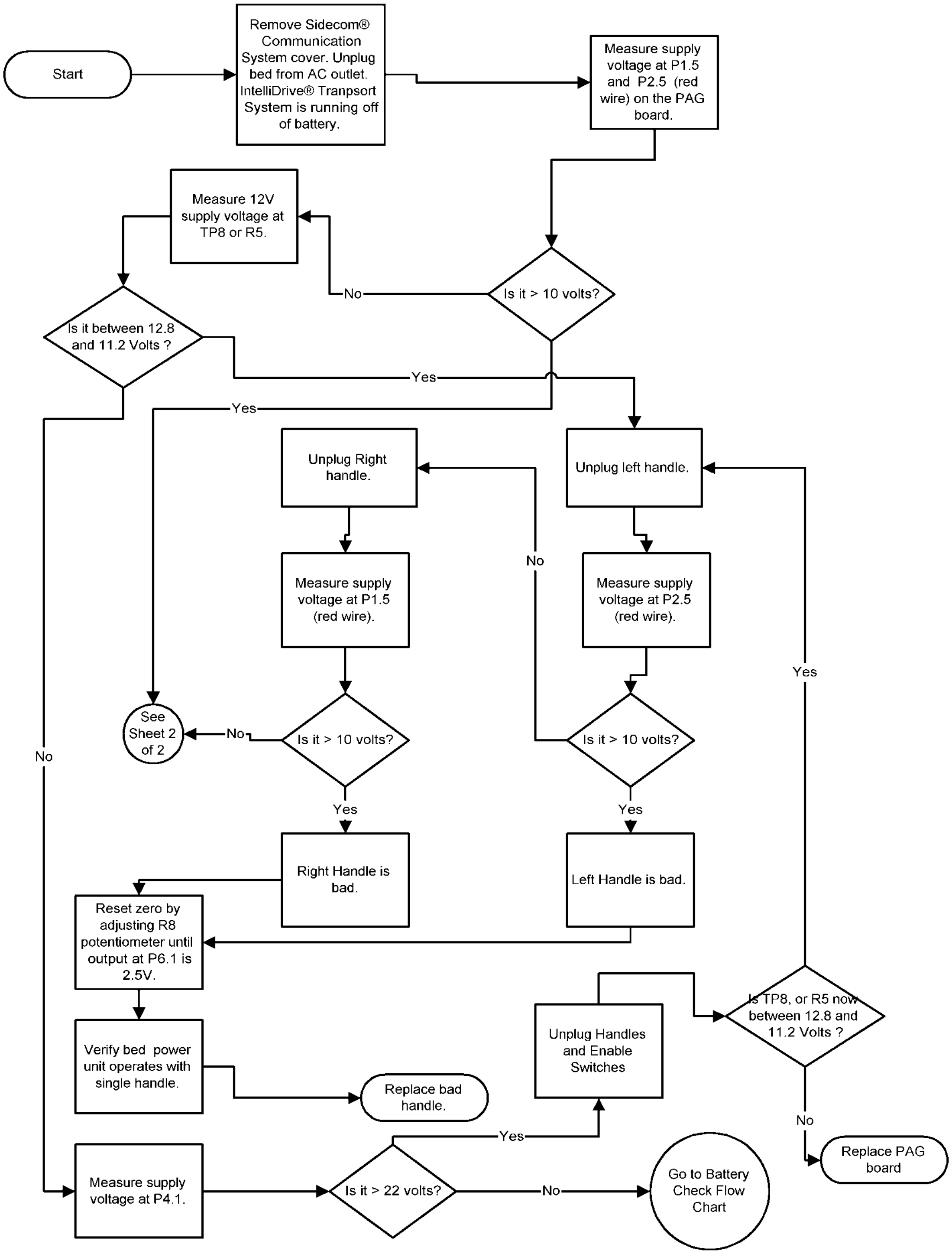
2.55 Handle Enable Switch Check (IntelliDrive® Transport System)


Start
Remove Sidecom cover. Unplug bed from AC outlet.
Measure DC voltage at P4.13. (Can use metal tray as ground reference.)
Is it > 4.0 volts
No
Measure supply voltage at P4.1.
Is it > 20 volts
No
Go to Battery Check Flow Chart
Yes
Yes
Go to following:
1) PACM Deployment Check
2) PACM board Check Flow Chart
Measure DC voltage at P4.15, when switch is open - not depressed.
Is it < .7 vollts
No
Unplug each handle one at a time and remeasure DC voltage at P4.15. With both switches open: voltage <0.7 With at least one switch closed: voltage >4.0
Is there a bad handle switch?
Yes
No
Yes
Measure DC voltage at P4.15, switch is depressed.
Inspect PAG board connections, replace if necessary.
Verify bed works with single good handle. Replace bad handle.
Is it > 4.0 vollts
No
PAG board faulty
No
Yes
Switches are OK, need to verify Enable switch at PACM board.
Yes
Replace PAG board, calibrate sensors and test again.

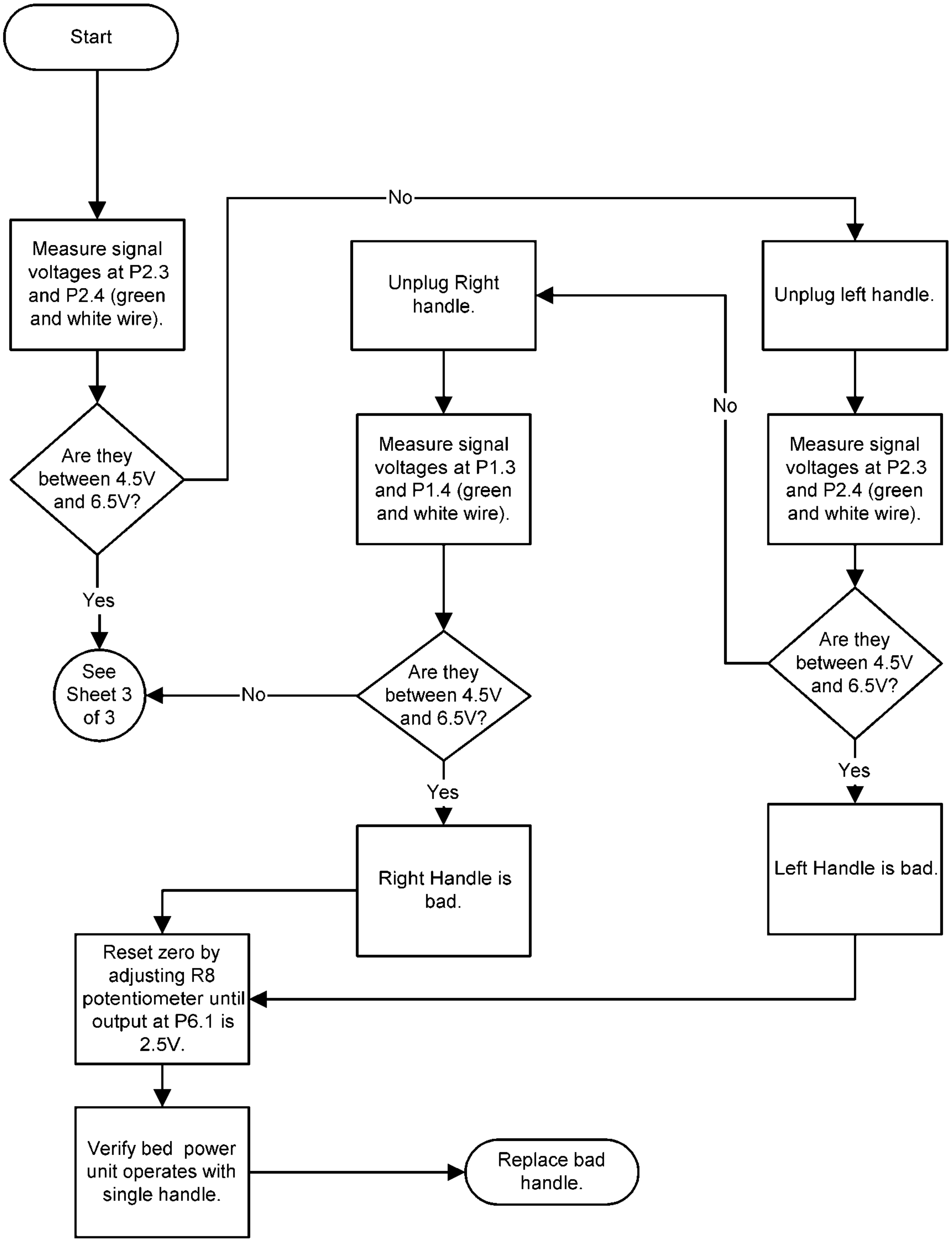
2.56 Throttle Check (IntelliDrive® Transport System)


Start
Remove Sidecom® Communication System cover. Unplug bed from AC outlet. IntelliDrive® Transport System is running off of battery.
Measure supply voltage at P4.1on PAG board.
Is it > 22 volts?
No
Go to Battery Check Flow Chart
Yes
Measure 12V supply voltage at TP8 or R5 on PAG board..
Is it between 12.8 and 11.2 Volts
No
Unplug handles and Enable switch P2, P3, P4, P5.
Is 12V supply between 12.8 and 11.2 Volts?
No
Replace PAG board.
Yes
Yes
Measure PAG output at P6.1 or P4.3. Make sure bed is flat.
Is handle damaged?
No
Yes
Replace handle.
Is voltage between 2.4V and 2.6V?
No
Is voltage between 1.5V and 3.9V?
Yes
Adjust potentiometer R8 so V out is 2.5V±.1V with no force applied to handles.
Inspect handle to determine if it is damaged or bent.
No
Yes
Push each handle.
Pull each handle.
Does handle voltages increase when handle is pushed?
Do handle voltages decrease when pull on handle?
No
Go to Handle Gauge Check Flow Chart
Yes
Yes
Yes
Is max voltage between 4.0 and 4.5 V ?
No
Is min voltage between 0.4 and 1.5 V?
No
Replace PAG board
No
Yes
Throttle is OK

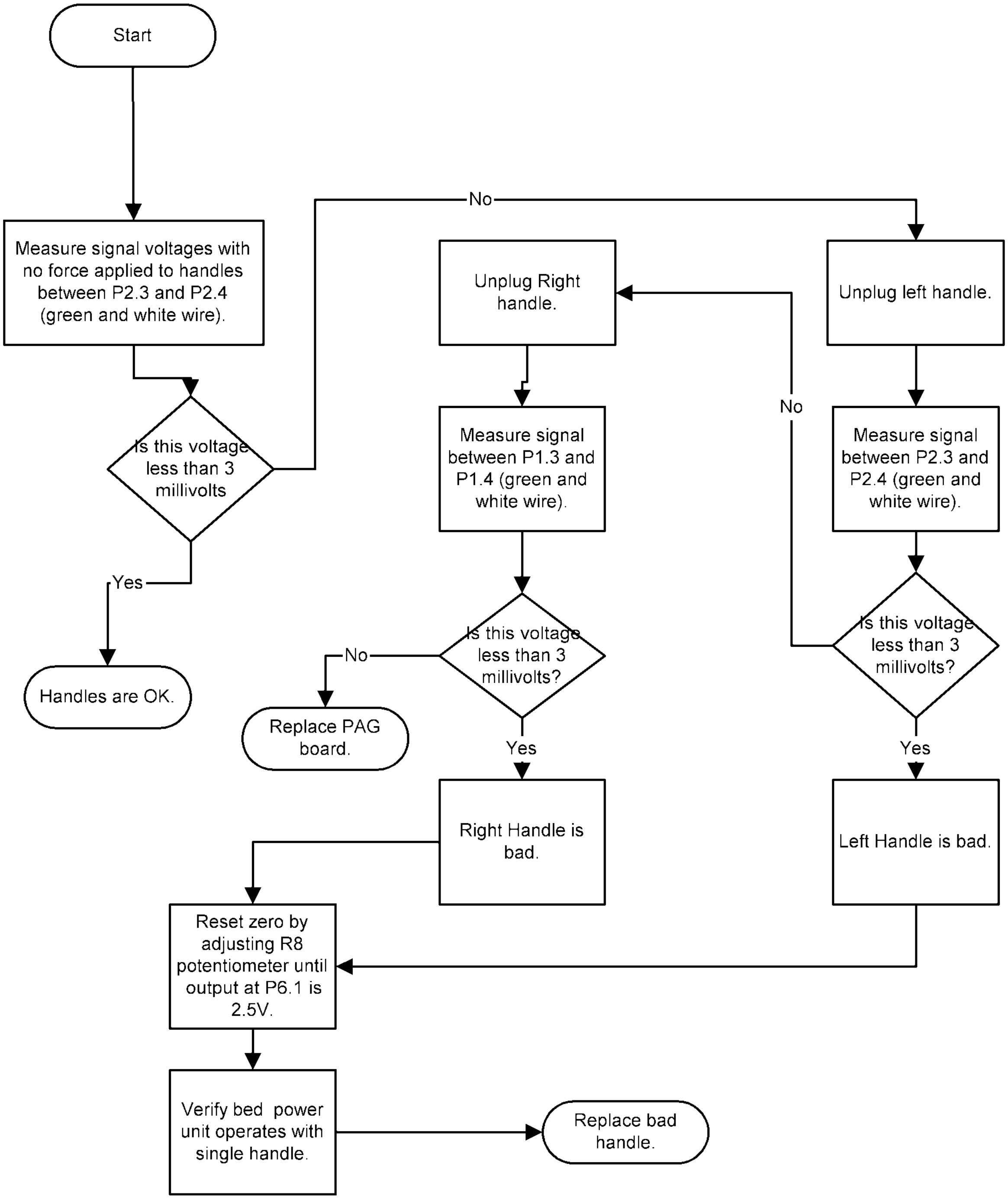
2.57 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 1 of 3)


Start
Remove Sidecom® Communication System cover. Unplug bed from AC outlet. IntelliDrive® Tranpsort System is running off of battery.
Measure supply voltage at P1.5 and P2.5 (red wire) on the PAG board.
Is it > 10 volts?
No
Measure 12V supply voltage at TP8 or R5.
Is it between 12.8 and 11.2 Volts ?
Yes
Yes
No
Unplug Right handle.
Unplug left handle.
Measure supply voltage at P1.5 (red wire).
Measure supply voltage at P2.5 (red wire).
No
Yes
See Sheet 2 of 2
No
Is it > 10 volts?
Is it > 10 volts?
Yes
Yes
Right Handle is bad.
Left Handle is bad.
Reset zero by adjusting R8 potentiometer until output at P6.1 is 2.5V.
Verify bed power unit operates with single handle.
Replace bad handle.
Unplug Handles and Enable Switches
Is TP8, or R5 now between 12.8 and 11.2 Volts ?
No
Replace PAG board
Yes
Measure supply voltage at P4.1.
Is it > 22 volts?
No
Go to Battery Check Flow Chart

2.58 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 2 of 3)


Start
Measure signal voltages at P2.3 and P2.4 (green and white wire).
Are they between 4.5V and 6.5V?
No
Yes
See Sheet 3 of 3
Unplug Right handle.
Measure signal voltages at P1.3 and P1.4 (green and white wire).
Are they between 4.5V and 6.5V?
No
Yes
Right Handle is bad.
Unplug left handle.
Measure signal voltages at P2.3 and P2.4 (green and white wire).
Are they between 4.5V and 6.5V?
No
Yes
Left Handle is bad.
Reset zero by adjusting R8 potentiometer until output at P6.1 is 2.5V.
Verify bed power unit operates with single handle.
Replace bad handle.

2.59 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 3 of 3)


Start
Measure signal voltages with no force applied to handles between P2.3 and P2.4 (green and white wire).
Is this voltage less than 3 millivolts
No
Yes
Handles are OK.
Unplug Right handle.
Measure signal between P1.3 and P1.4 (green and white wire).
Is this voltage less than 3 millivolts?
No
Replace PAG board.
Yes
Right Handle is bad.
Unplug left handle.
Measure signal between P2.3 and P2.4 (green and white wire).
Is this voltage less than 3 millivolts?
No
Yes
Left Handle is bad.
Reset zero by adjusting R8 potentiometer until output at P6.1 is 2.5V.
Verify bed power unit operates with single handle.
Replace bad handle.

2.60 Controller Check—IntelliDrive® Transport System

1. Remove the drive box from the bed.

2. Place the drive box on wooden supports so the drive belt will not touch the ground when it deploys.

3. Connect the bed cables running into the box.

4. Locate DS 1 on the PACM board.

5. Observe the following on DS 1:

- LED DS 1 is off—The controller is either not powered or is not getting a KS 1 signal (which should be present if the wheel is deployed).
- LED DS 1 is on and steady—Controller is operating correctly.
- LED DS 1flashing—Record the flash pattern. Use the brake/steer pedal to cycle the drive belt. Observe the LED DS 1. If LED DS 1 is still flashing, refer to table 2-18 on page 2-230 for error codes.

Table 2-18. Controller Error Codes

Flash Code	Description	Possible Cause
¤ ¤	Thermal Cutback	1) Make sure the bed temperature is within the normal operating range (15-40 degrees C). 2) Check for mechanical binding or item stuck in drive train or belt. 3) Replace Controller.
¤ ¤¤	Throttle Fault 1	1) Check to make sure the controller is getting approximately 2.5V input when the handles are neutral, 4.0 V when they are pushed forward, and 1.0 V when they are pulled back. If these voltages are not present, the problem is in either the PAG board, the cable from controller to PAC board, or the cable from PAC to PAG. 2) If voltages are OK, replace controller.
¤ ¤¤¤	SPD Limit Pot Fault	1) Check the cable from controller to PAC board and cable from PAC to PAG board. 2) Replace Controller. 3) Replace PAG board.
¤ ¤¤¤¤	Low Battery Voltage	1) Make sure the controller is getting proper battery voltage. 2) Replace Controller.

Flash Code	Description	Possible Cause
¤ ¤¤¤¤¤	Overvoltage	1) Make sure the controller is getting proper battery voltage. 2) Replace Controller.
¤¤ ¤	Main OFF Fault	1) Check motor wiring. 2) Make sure the controller is getting proper battery voltage. 3) Replace Controller.
¤¤ ¤¤¤	Main Cont FLTS	1) Check motor wiring. 2) Make sure the controller is getting proper battery voltage. 3) Replace Controller.
¤¤ ¤¤¤¤	Main ON Fault	1) Check motor wiring. 2) Make sure the controller is getting proper battery voltage. 3) Replace Controller.
¤¤¤ ¤	PROC/Wiring Fault	1) Replace Controller.
¤¤¤ ¤¤	Brake ON Fault	1) Replace Controller.
¤¤¤ ¤¤¤	Precharge Fault	1) Make sure the controller is getting proper battery voltage. 2) Replace Controller.
¤¤¤ ¤¤¤¤	Brake OFF Fault	1) Replace Controller.
¤¤¤ ¤¤¤¤¤	HPD	1) Replace Controller.
¤¤¤¤ ¤	Current Sense Fault	1) Check motor wiring. 2) Make sure the controller is getting proper battery voltage. 3) Replace Controller.
¤¤¤¤ ¤¤	HW Failsafe	1) Check motor wiring. 2) Replace controller.
¤¤¤¤ ¤¤¤	EEPROM Fault	1) Replace Controller.
¤¤¤¤ ¤¤¤¤	Power Section Fault	1) Check motor wiring. 2) Make sure the controller is getting proper battery voltage. 3) Replace Controller.

2.61 Visual Inspection—IntelliDrive® Transport System

Tools required: Flashlight Inspection mirror

1. Check the unit for external damage.
2. Using the mirror and flashlight, check for debris around the pulleys and levers.
3. Check the belt for damage and proper engagement on the pulleys.
4. Remove the drive unit from the bed.
5. Inspect the links and levers in the motor area for damage.
6. Remove the drive mechanism cover.
7. Check the tension on the drive belt.
8. Check overall condition of all components in the drive box.
9. Install the unit onto the bed.

2.62 PAG Board Debugging—IntelliDrive® Transport System

NOTE:
When working on IntelliDrive® Transport System use extreme caution when servicing the product. Whenever you are measuring voltages or making adjustments to the PAG board, it is suggested that you take the bed out of steer which will raise the wheel and prevent the bed from moving.

Enable Switches

The enable switches are installed in the handles at the handle grip. If either switch is depressed, while force is applied to the handles, the bed will move. If the handles are pushed towards the patient, the bed will move forward. If the handles are pulled, the bed will move backwards. It is fairly simple to check the enable switches. First remove the SideCom® Communication System cover so you can see the PAG board. Verify both enable switches are plugged into the PAG board at P3 and P5. The switches are connected in parallel, or combined on the PAG board. The following voltages will be observed on a functioning system.

P4.13	4.0-5.1 V
P4.15	0-.5 V when switch is opened
P4.15	4.0-5.1 V when switch is depressed or closed

If you suspect a switch is not functioning properly, the switches can be unplugged at P3 and P5. A meter can be used to measure switch continuity from the end of the switch cable. A working switch will close only when the switch is depressed. If it is always opened, or always closed, the switch or cable is defective. In either case replace the handle assembly. The bed will operate if only one switch functions. You can unplug the defective switch from the PAG board and verify the bed power unit operates when using the working switch.

If there is not a voltage at P4.13, verify the battery voltage or the battery charging voltage is present. The battery voltage can be measure at P4.1. This voltage will be greater than 32V when the bed is plugged into the AC wall outlet. When the bed is unplugged from the AC outlet, the battery voltage at P4.1 will be greater than 22V, if the batteries are charged. If no voltage is present, or the battery voltage is low, go to the battery checkout procedure.

If the switches check out properly, and the voltage at P4.15 does not toggle when the switch is depressed, there may be a problem on the PAG board or the

15-pin connector at P4. Unplug the cable connected to P4 and inspect the connector pins at P4 on the PAG board. Also, check connectors P3 and P5 where the enable switches plug into the PAG board.

The combined enable switch signal runs down the head lift arm to the PACM board via the PAG-PACM board cable (68441). To verify the signal is being received at the PACM board, unplug the 15-pin cable from the PACM board and measure continuity across pins 13(orange) and 15 (white/orange). When either switch is depressed the switch closure can be measured across the pins.

Throttle Debugging

The base part of the handle that connects to the frame contains a strain element that provides an output signal proportional to the force applied to the handle. The handles are very similar to the load beams used in the scale system. The PAG board amplifies this signal and provides an output to the PACM board.

Verify the output signal is correct at P6.1 or P4.3. The plated SideCom® Communication System tray can be used as a ground reference for measuring signals. When no force is applied to the handle the output signal should measure 2.4V to 2.6V DC. The zero voltage output can be adjusted by turning potentiometer R8 until the output signal measures 2.5V. When either handle is pushed, the output signal will increase until it reaches 4.0V to 4.5V. When either handle is pulled the output signal will decrease until it reaches 0.4V to 1.5V. This indicates the throttle circuit functions properly.

Before making any adjustments verify the supply voltages. The supply voltage at P4.1 will measure more than 22V on a working system. If no voltage is present, or the battery voltage is low, go to the battery checkout procedure.

The excitation voltage, P1.5 and P2.5 (red wire) will measure 10V to 12V on a working board. Also, the signal voltages at P1.3, P2.3, P1.4, and P2.4 will be approximately ½ the voltage measured at P1.5 and P2.5. These are the green and white wires on the handle connectors P1 and P2. If the excitation voltage is lower than 10V, unplug the connectors P1 and P2 one at a time to see if the voltage comes into range. If this occurs, one of the handles is probably damaged and needs to be replaced. If the voltage never comes into range, verify the 12V supply at TP8 or R5 on the PAG board. If a bad strain element is suspected, unplug the bad handle, readjust the zero output to 2.5V with potentiometer R8. Verify the bed power unit operates using the good handle. Replace the damaged handle.

If the output voltage at P6.1 cannot be adjusted to within 2.4V to 2.6V using the potentiometer R8, with no force applied to the handles, the strain element may be damaged. The bed will operate with a single handle after the zero is adjusted. To check the handles, unplug one of the handles and see if R8 can be adjusted so the output signal is 2.5V. The handle that will not allow adjustment of the potentiometer to bring the output signal to 2.5V is the damaged handle.

The motor controller will not operate unless it sees the connection to the 4700 ohm resistor on the PAG board. To verify the signal is being received at the PACM board, unplug the 15-pin cable from the PACM board and measure the resistance across pins 5 (brown) and 6 (white/brown). The resistance needs to measure 4700 ohms +/- 5%. If this measurement fails check the cable for continuity and inspect the PAG board. The cable connections are the same on both ends. If the cable checks out, inspect the connector P4 on the PAG board. If the cable is bad, replace the cable, otherwise replace the PAG board.

2.63 NAWI Class IIII Scale (European Version)/Graphical Caregiver Interface (GCI)® Control Malfunction

NOTE:
If the Graphical Caregiver Interface (GCI)® Control has a user interface that displays a continuous weight, it is a NAWI Class IIII Scale (European version). This scale system is required for Europe; however, it may be installed in other countries. The following procedure applies **only** to the NAWI Class IIII Scale.

1. The TotalCare® Bed System is plugged into an appropriate power source.

   Yes **No**
   ↓ → Plug the unit into an appropriate power source. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 2.

2. Inspect all cabling of the NAWI Class IIII Scale and Graphical Caregiver Interface (GCI)® Control. All cabling is securely connected.

   Yes **No**
   ↓ → Securely connect all cabling. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 3.

3. At the Graphical Caregiver Interface (GCI)® Control, perform the following to view the fault codes from the scale P.C. board:

NOTE:
To help determine the cause when problems are encountered, the Graphical Caregiver Interface (GCI)® Control logs the fault codes from the scale P.C. board.

   a. Hold the **Up** and **Down** arrow keys for 20 seconds. The **Service Menu** screen appears.
   b. Scroll to **Service required status**, and press **Enter**. The fault codes encountered appear listed as follows, where “xxx” is the fault code:

ID	Code	Fault1	Fault2	Fault3	Fault4	Date	Time
51	1	xxx	xxx	xxx	xxx		

NOTE:
All fault codes for the NAWI Class IIII Scale (European version) start with the ID **51**.

   c. To help determine the problem, refer to table 2-6 on page 2-100 for a listing of NAWI Class IIII Scale (European version) fault codes.

The problem still exists.

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

4. The scale sends back the message **Center patient in bed before proceeding**.

   Yes **No**
   ↓ → Go to step 6.

5. One of the load beam readings is out of range. Go to RAP 2.64.

6. The scale sends back the message **Task request cannot be achieved at this moment**.

   Yes **No**
   ↓ → Go to step 8.

7. The Graphical Caregiver Interface (GCI)® Control cannot communicate with the scale, or the scale P.C. board detects errors. Go to RAP 2.65.

8. The weight is always **0**.

   Yes **No**
   ↓ → Go to step 10.

9. Calibrate the scale (refer to procedure 4.2). The problem still exists.

   Yes **No**
   ↓ → Go to “Final Actions” on page 2-18.

10. At the end of calibration, the scale sends back a value that is greater than **100**.

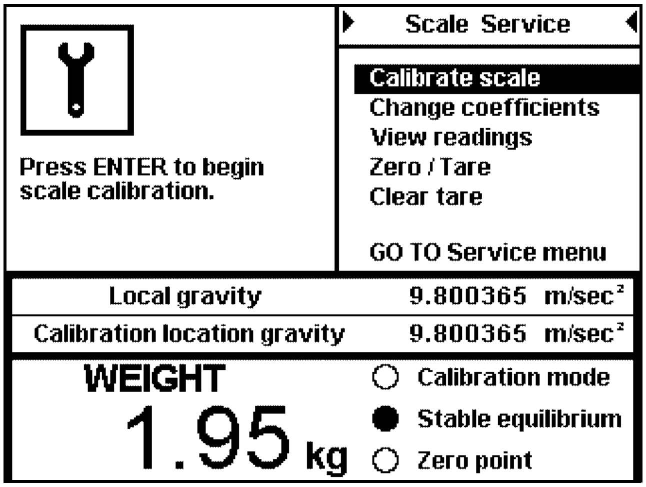
    Yes **No**
    ↓ → A calibration error exists. Go to RAP 2.66.

11. The Graphical Caregiver Interface (GCI)® Control displays the message **Task request cannot be achieved Minimum tare**.

    Yes **No**
    ↓ → Go to step 13.

12. The scale fails the Tare and Auto compensation commands. Perform the following:
    a. At the Graphical Caregiver Interface (GCI)® Control, hold the **Up** and **Down** arrow keys for 20 seconds. The **Service Menu** screen displays.
    b. Scroll to *Scale Service*, and press **Enter**. The **Scale Service** screen displays (see figure 2-2 on page 2-238).

Figure 2-2. Scale Service Screen


Scale Service
Calibrate scale
Change coefficients
View readings
Zero / Tare
Clear tare
GO TO Service menu

Press ENTER to begin scale calibration.

Local gravity 9.800365 m/sec²

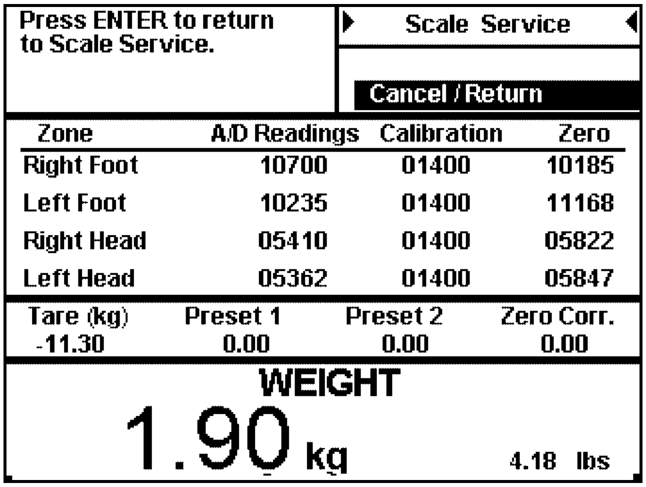
Calibration location gravity 9.800365 m/sec²

WEIGHT 1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

c. Scroll to *View Readings*, and press **Enter**. The A/D readings, calibration coefficients, and zero point values for each load beam display (see figure 2-3 on page 2-238).

Figure 2-3. Scale Service—View Readings Screen


Scale Service
Cancel / Return

Press ENTER to return to Scale Service.

Zone	A/D Readings	Calibration	Zero
Right Foot	10700	01400	10185
Left Foot	10235	01400	11168
Right Head	05410	01400	05822
Left Head	05362	01400	05847

Tare (kg)	Preset 1	Preset 2	Zero Corr.
-11.30	0.00	0.00	0.00

WEIGHT 1.90 kg 4.18 lbs

d. Read the values for **Tare**, **Preset1**, **Preset2**, and **Zero-Corr.**, and add the values for **Tare**, **Preset1**, and **Preset2**.

Tare + **Preset1** + **Preset2** is positive.

Yes **No**
↓ → Go to step 15.

13. The problem still exists.

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

14. Go to step 20.

15. The PPM and PRM modules were removed during calibration.

Yes **No**
↓ → Remove the PPM and PRM modules, and then recalibrate the scale (refer to procedure 4.2). If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 16.

16. Items are being added to or removed from the bed.

Yes **No**
↓ → Go to step 19.

17. The autocompensation feature is used when items are both added to and removed from the bed.

Yes **No**
↓ → When adding or removing items on the bed, use the autocompensation feature. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 18.

18. When adding items to bed, take the first weight reading **without** the item added, add the item to the bed, and then take the second weight reading **with** the item added. The problem still exists.

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

19. Add the values for **Tare**, **Preset1**, **Preset2**, **Zero-Corr**, and the **weight display**. **Tare** + **Preset1** + **Preset2** + **Zero-Corr** + **weight display** is -17.99 lb (-8.16 kg) or greater.

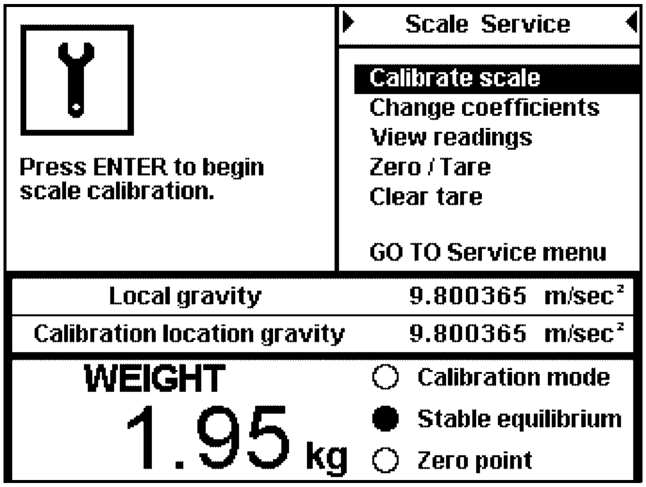
Yes **No**
↓ → If this value is less than -17.99 lb (-8.16 kg), the bed **cannot** be tared. Recalibrate the scale (refer to procedure 4.2). If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, call Hill-Rom Technical Support at (800) 445-3720 for assistance.

20. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2.64 Scale/Graphical Caregiver Interface (GCI)® Control Diagnostics and Error Troubleshooting Diagnostics (NAWI Class IIII Scale—European Version Only)

1. Perform the following:
   a. At the Graphical Caregiver Interface (GCI)® Control, hold the **Up** and **Down** arrow keys for 20 seconds. The **Service Menu** screen displays.
   b. Scroll to *Scale Service*, and press **Enter**. The **Scale Service** screen displays (see figure 2-4 on page 2-240).

Figure 2-4. Scale Service Screen



Press ENTER to begin scale calibration.

Local gravity 9.800365 m/sec²

Calibration location gravity 9.800365 m/sec²

WEIGHT 1.95 kg

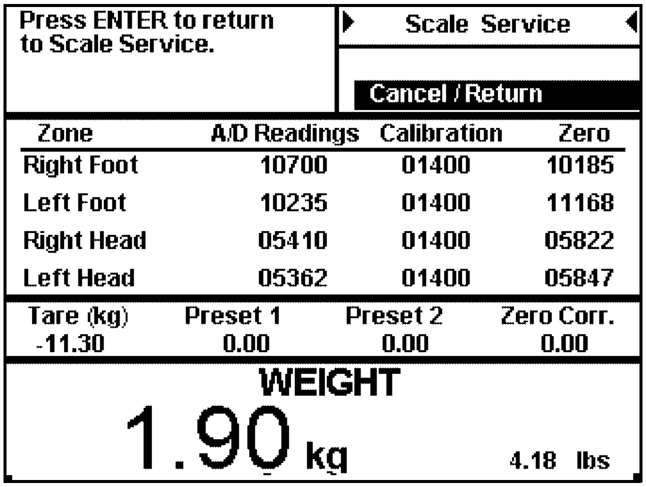
○ Calibration mode

● Stable equilibrium

○ Zero point

   c. Scroll to *View Readings*, and press **Enter**. The A/D readings, calibration coefficients, and zero point values for each load beam display (see figure 2-5 on page 2-241).

Figure 2-5. Scale Service—View Readings Screen



Press ENTER to return to Scale Service.

Zone	A/D Readings	Calibration	Zero
Right Foot	10700	01400	10185
Left Foot	10235	01400	11168
Right Head	05410	01400	05822
Left Head	05362	01400	05847

Tare (kg)	Preset 1	Preset 2	Zero Corr.
-11.30	0.00	0.00	0.00

WEIGHT

1.90 kg 4.18 lbs

d. Check the A/D readings for each zone.

The A/D readings for a zone is outside the range of **5000** to **25000**.

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

2. Perform the following:
   a. Record the A/D reading for the zone that is outside the range of **5000** to **25000**.
   b. Add some weight to the bed.
   c. Record the A/D reading for the zone.

   When weight is added to the bed, the load beam value increases.

   Yes **No**
   ↓ → Replace the load beam (refer to procedure 4.51). If this solves the problem, go to step 8. Otherwise, go to step 3.

3. The A/D readings for **all** zones are outside the range of **5000** to **25000**.

   Yes **No**
   ↓ → Go to step 5.

4. Go to RAP 2.67. The problem still exists.

   Yes **No**
   ↓ → Go to “Final Actions” on page 2-18.

5. Only **one** A/D reading of the four zones is outside the range of **5000** to **25000**.

   Yes No
   ↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

6. Switch the load beam connectors, and then check the A/D readings for each load beam again. The out-of-range A/D reading follows the load beam.

   Yes No
   ↓ → Replace the scale P.C. board (refer to procedure 4.50). If this solves the problem, go to step 8. Otherwise, go to step 7.

7. Replace the load beam (refer to procedure 4.51). This solves the problem.

   Yes No
   ↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

8. Perform the following:

   a. Calibrate the NAWI Class IIII Scale (European version) (refer to procedure 4.2).

NOTE:
If the scale P.C. board is replaced, the seal on the scale P.C. board breaks, and the scale **must** be calibrated.

   b. Have Hill-Rom Technical Support or an approved agency verify the calibration.

NOTE:
After a NAWI Class IIII Scale (European version) is calibrated, its calibration **must** be verified by Hill-Rom or an approved agency.

   The scale passes verification testing.

   Yes No
   ↓ → Go to RAP 2.68.

9. The problem still exists.

   Yes No
   ↓ → Go to “Final Actions” on page 2-18.

10. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2.65 Scale/Graphical Caregiver Interface (GCI)® Control—Communications Error (NAWI Class IIII Scale—European Version Only)

1. Perform the following:
   a. Using diagnostics, test the communication between the scale and the Graphical Caregiver Interface (GCI)® Control (refer to procedure 2.64).
   b. Scroll the values for **ID** to **50** for the scale and **100** for command, and press **Enter**.
   c. Scroll to *Send Node/command*, and press **Enter**. After a brief pause, some values from the scale displays in the response field on the screen.

   The scale responds with values **0** through **5**.

   Yes **No**
   ↓ → Go to step 3.

2. The scale and the Graphical Caregiver Interface (GCI)® Control communicate. Go to “Final Actions” on page 2-18.

3. Check the wiring between the PCM and the scale. The wiring is securely connected.

   Yes **No**
   ↓ → Securely connect the wiring between the PCM and the scale. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 4.

4. Replace the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26). The problem still exists.

   Yes **No**
   ↓ → Go to “Final Actions” on page 2-18.

NOTE:
If you suspect a failure to be in **either** the Graphical Caregiver Interface (GCI)® Control **or** the scale, first try replacing the Graphical Caregiver Interface (GCI)® Control to avoid the need for scale calibration.

5. Perform the following:
   a. Replace the scale P.C. board (refer to procedure 4.50).
   b. Calibrate the NAWI Class IIII Scale (European version) (refer to procedure 4.2).

NOTE:
If the scale P.C. board is replaced, the seal on the scale P.C. board breaks, and the scale **must** be calibrated.

c. Have Hill-Rom Technical Support or an approved agency verify the calibration.

NOTE:
After a NAWI Class IIII Scale (European version) is calibrated, its calibration **must** be verified by Hill-Rom or an approved agency.

The scale passes verification testing.

Yes **No**
↓ → Go to RAP 2.68.

6. The problem still exists.

Yes **No**
↓ → Go to "Final Actions" on page 2-18.

7. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2.66 Scale/Graphical Caregiver Interface (GCI)® Control—Calibration Error (NAWI Class IIII Scale—European Version Only)

1. Calibrate the scale (refer to procedure 4.2). At the end of calibration, the scale returns error codes after it checks for error conditions.

Yes **No**
↓ → No calibration errors exist. Go to "Final Actions" on page 2-18.

2. Perform the following:

a. Refer to table 2-19 on page 2-245 for a list of possible calibration error codes, and identify the error condition the scale discovers.

Table 2-19. Calibration Error Codes

Error Code	Description
1	Beam readings are not valid.
2	Zero readings are not valid.
4	Maximum reading for weight on right foot is incorrect.
5	Maximum reading for weight on left foot is incorrect.
6	Maximum reading for weight on left head is incorrect.
7	Maximum reading for weight on right head is incorrect.
20	Matrix calculation error.
21	Coefficient range error.

b. Check the placement of the calibration weight.

The calibration weight is placed correctly on the bed.

Yes **No**
↓ → Correctly place the calibration weight on the bed. If this solves the problem, go to "Final Actions" on page 2-18. Otherwise, go to step 3.

3. Inspect the load beam. The load beam wiring is connected to the correct connector.

Yes No
↓ → Connect the load beam wiring to the correct connector. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 4.

4. Replace the load beam (refer to procedure 4.51). The problem still exists.

Yes No
↓ → Go to step 6.

5. Replace the scale P.C. board (refer to procedure 4.50). This solves the problem.

Yes No
↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

6. Perform the following:

   a. Calibrate the NAWI Class IIII Scale (European version) (refer to procedure 4.2).

NOTE:
If the scale P.C. board is replaced, the seal on the scale P.C. board breaks, and the scale **must** be calibrated.

   b. Have Hill-Rom Technical Support or an approved agency verify the calibration.

NOTE:
After a NAWI Class IIII Scale (European version) is calibrated, its calibration **must** be verified by Hill-Rom or an approved agency.

The scale passes verification testing.

Yes No
↓ → Go to RAP 2.68.

7. The problem still exists.

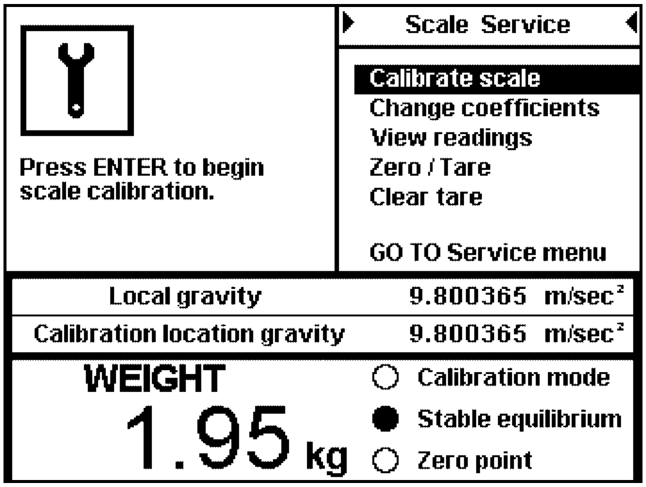
Yes No
↓ → Go to “Final Actions” on page 2-18.

8. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2.67 Load Beam—Shorted Excitation Voltage (NAWI Class IIII Scale—European Version Only)

1. Perform the following:
    a. At the Graphical Caregiver Interface (GCI)® Control, hold the **Up** and **Down** arrow keys for 20 seconds. The **Service Menu** screen displays.
    b. Scroll to *Scale Service*, and press **Enter**. The **Scale Service** screen displays (see figure 2-6 on page 2-247).

Figure 2-6. Scale Service Screen


Scale Service
Calibrate scale
Change coefficients
View readings
Zero / Tare
Clear tare
GO TO Service menu

Press ENTER to begin scale calibration.

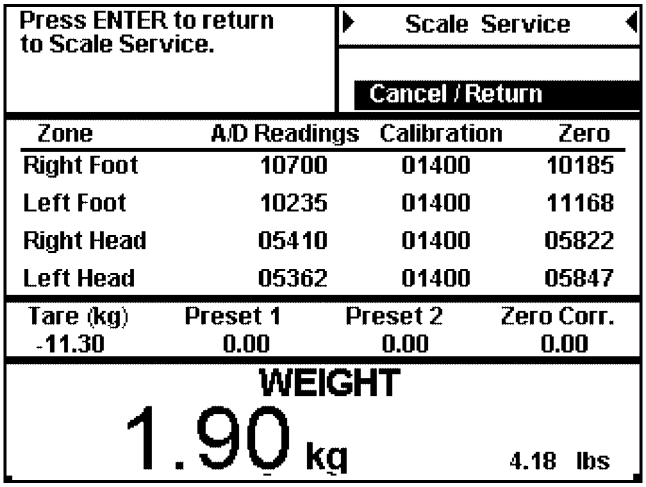
Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

WEIGHT 1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

    c. Scroll to *View Readings*, and press **Enter**. The A/D readings, calibration coefficients, and zero point values for each load beam display (see figure 2-7 on page 2-247).

Figure 2-7. Scale Service—View Readings Screen


Scale Service
Cancel / Return

Press ENTER to return to Scale Service.

Zone	A/D Readings	Calibration	Zero
Right Foot	10700	01400	10185
Left Foot	10235	01400	11168
Right Head	05410	01400	05822
Left Head	05362	01400	05847

Tare (kg)	Preset 1	Preset 2	Zero Corr.
-11.30	0.00	0.00	0.00

WEIGHT 1.90 kg 4.18 lbs

d. Check the A/D readings for each zone.

All four zones display an A/D reading of **0** or another very low value (count).

Yes **No**
↓ → Go to “Final Actions” on page 2-18.

2. A load beam may have the +5V shorted to ground. Ensure that the load beams are electrically connected, and test the load beam shorted excitation voltage (see “Load Beam Shorted Excitation Voltage Tests” on page 2-248).

Load Beam Shorted Excitation Voltage Tests

Test 1

1. Using a calibrated digital voltmeter, perform the following to check for a shorted load beam:
    a. Measure the voltage from the scale P.C. board to the **black** wire beam connector, and record the voltage at pin 2.
    b. Measure the voltage from the scale P.C. board cover to the **red** wire beam connector, and record the voltage at pin 5.

The **black** wire, pin 2, measures **0V**, and the **red** wire, pin 5, measures **4.75V** to **5.25V**.

Yes **No**
↓ → Go to step 3.

2. Go to “Test 2” on page 2-249.

3. Perform the following:
    a. Disconnect the load beams, one at a time, until the voltage changes to the proper value.
    b. When the voltage changes to the proper value, replace the last load beam disconnected (refer to procedure 4.51).

This solves the problem.

Yes **No**
↓ → Go to “Test 2” on page 2-249.

4. Go to “Final Actions” on page 2-18.

Test 2

1. Perform the following to check for a shorted load beam:
    1. Disconnect the load beams, one at a time, and monitor the A/D readings until the A/D readings change to within the range of **5000** to **25000**.
    2. When the A/D readings change to within the range of **5000** to **25000**, replace the last load beam disconnected (refer to procedure 4.51).

   This solves the problem.

   Yes **No**
   ↓ → Go to step 3.

2. Go to “Final Actions” on page 2-18.

3. The problem is intermittent.

   Yes **No**
   ↓ → Go to step 5.

4. Go to “Test 3” on page 2-249.

5. The load beam is **not** mounted in the bed.

   Yes **No**
   ↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

6. Go to “Test 4” on page 2-250.

Test 3

1. The problem is intermittent.

   Yes **No**
   ↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2. Using a calibrated digital megameter, perform the following to check each load beam, one at a time, for a short:
    1. Disconnect the load beam from the bed.
    2. Connect one side of the megameter to the bed frame.
    3. Connect the other side of the megameter to one of the load beam’s wires—red, black, white, or green.

The resistance measures greater than **5000** megaohms.

Yes **No**
↓ → Replace the load beam (refer to procedure 4.51). If this solves the problem, go to "Final Actions" on page 2-18. Otherwise, call Hill-Rom Technical Support at (800) 445-3720 for assistance.

3. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

Test 4

1. The load beam is **not** mounted in the bed.

Yes **No**
↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

2. Using a calibrated digital megameter, perform the following to check each load beam, one at a time, for a short:
   a. Connect one side of the megameter to the body of the load beam.
   b. Connect the other side of the megameter to one of the load beam's wires—red, black, white, or green.

The resistance measures greater than **5000** megaohms.

Yes **No**
↓ → Replace the load beam (refer to procedure 4.51). If this solves the problem, go to "Final Actions" on page 2-18. Otherwise, call Hill-Rom Technical Support at (800) 445-3720 for assistance.

3. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

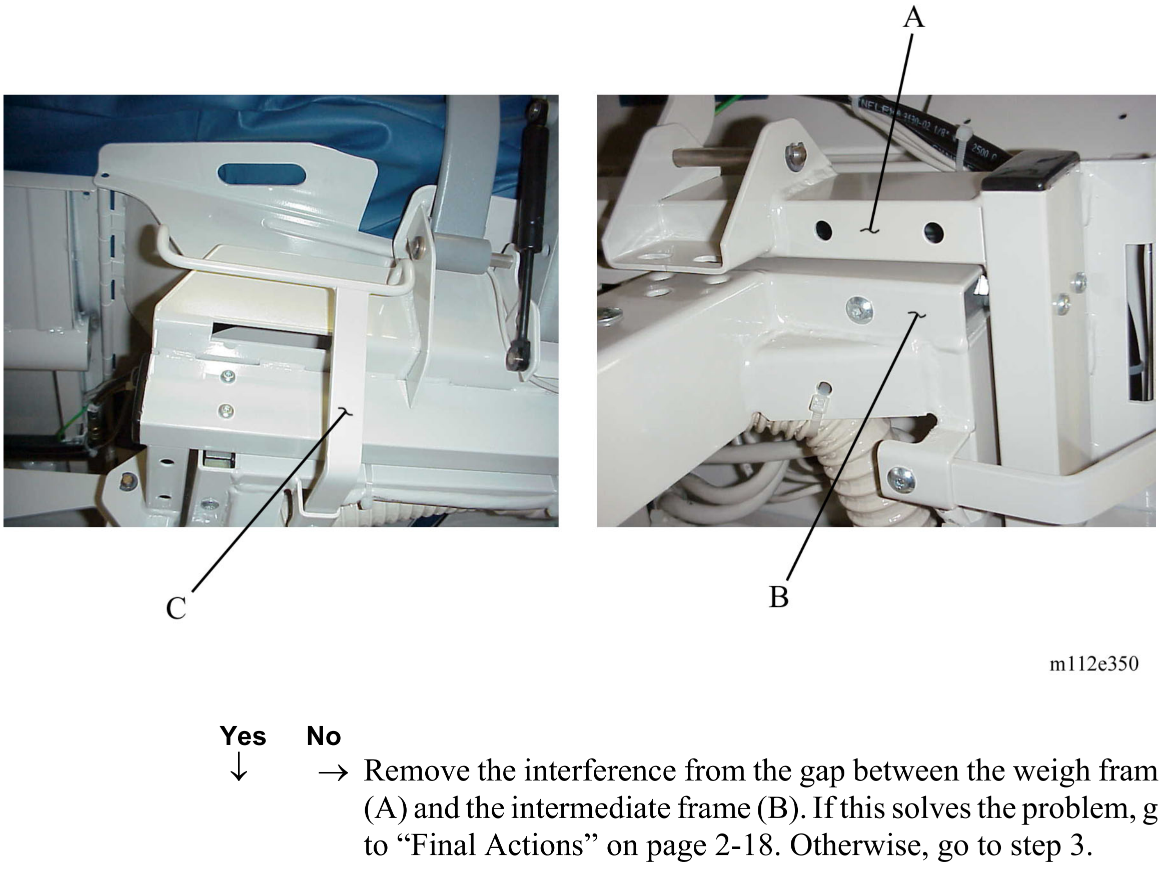
2.68 Scale Fails Verification Testing (NAWI Class IIII Scale—European Version Only)

1. Inspect the load beam mounting screws. The load beam mounting screws are tight.

Yes **No**
↓ → Tighten the load beam mounting screws. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 2.

2. Check for interference, such as pinched or rubbing cables, wire ties, or hoses, in the gap between the weigh frame (A) and the intermediate frame (B) (see figure 2-8 on page 2-251). The weigh frame (A) and the intermediate frame (B) are free from interference.

Figure 2-8. Frame Interference



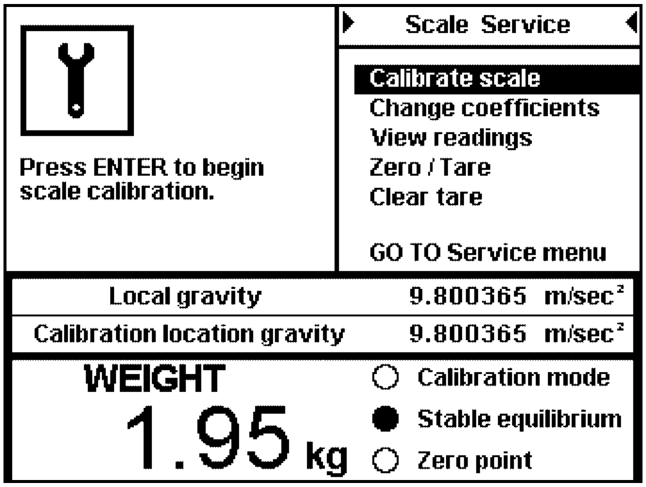
Yes **No**
↓ → Remove the interference from the gap between the weigh frame (A) and the intermediate frame (B). If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 3.

3. Inspect the drainage bag holders (C). The drainage bag holders (C) are in good condition and not bent.

Yes No
↓ → Replace the damaged drainage bag holder. If this solves the problem, go to “Final Actions” on page 2-18. Otherwise, go to step 4.

4. Perform the following:
   a. At the Graphical Caregiver Interface (GCI)® Control, hold the **Up** and **Down** arrow keys for 20 seconds. The **Service Menu** screen displays.
   b. Scroll to *Scale Service*, and press **Enter**. The **Scale Service** screen displays (see figure 2-9 on page 2-252).

Figure 2-9. Scale Service Screen



Press ENTER to begin scale calibration.

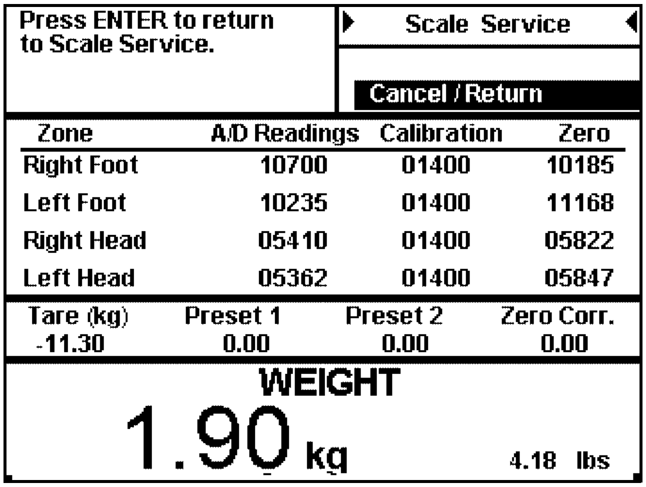
Local gravity	9.800365 m/sec^2
Calibration location gravity	9.800365 m/sec^2

WEIGHT
1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

   c. Scroll to *View Readings*, and press **Enter**. The A/D readings, calibration coefficients, and zero point values for each load beam display (see figure 2-10 on page 2-253).

Figure 2-10. Scale Service—View Readings Screen



Press ENTER to return to Scale Service.

Zone	A/D Readings	Calibration	Zero
Right Foot	10700	01400	10185
Left Foot	10235	01400	11168
Right Head	05410	01400	05822
Left Head	05362	01400	05847

Tare (kg)	Preset 1	Preset 2	Zero Corr.
-11.30	0.00	0.00	0.00

WEIGHT
1.90 kg 4.18 lbs

5. Check for a discrepancy in the calibration coefficients. One calibration coefficient is significantly different from the others. Calibration coefficients will normally be different; however, the variation will be less than a few hundred counts.

NOTE:
For example, refer to table 2-20 on page 2-253, where the calibration coefficient for the left head is **1147**, representing the response of 114.7 A/D counts per kg. The right foot calibration coefficient is lower than the others by more than 100, with a response of 90 A/D counts per kg, indicating possible interference between the right foot of the weigh frame and the intermediate frame.

Table 2-20. Calibration Coefficients (Example)

Left head	1147
Right head	1199
Left foot	1117
Right foot	900

NOTE:
A/D counts represents a voltage response from the load beam when weight is applied to it.

Yes **No**
↓ → For assistance, call Hill-Rom Technical Support at (800) 445-3720.

6. Remove the interference from the frame. The problem still exists.

   Yes **No**
   ↓ → Go to “Final Actions” on page 2-18.

7. For assistance, call Hill-Rom Technical Support at (800) 445-3720.

Gravity Constants/Coefficients (NAWI Class IIII Scale—European Version Only)

Introduction

Gravity constants are a function of latitude and altitude and vary by geographical location. For examples of some gravity constants for different locations, refer to table 2-21 on page 2-255.

Table 2-21. Gravity Constants

Northern Europe Gravity: 9.8176	Central Europe Gravity: 9.808	Southern Europe Gravity: 9.8033
Finland	Belgium	Austria
Iceland	Czech Republic	Bulgaria
Norway	Denmark	France
Sweden	Germany	Greece
	Ireland	Hungary
	Latvia	Italy
	Lithuania	Portugal
	Luxembourg	Romania
	Netherlands	Slovakia
	Poland	Slovenia
	United Kingdom	Spain
		Switzerland

A bed calibrated in one location and then used in another location **must** compensate for the change in gravity at its place of use if the error for the scale is greater than ± 0.25 kg.

The load beams measure the force applied by a mass:

Force = mass*acceleration, where acceleration = gravity constant

When the gravity constant changes due to a change in geographical location, an error occurs due to the difference in gravity. The scale stores the gravity value for the place of calibration and the place of use. When the bed is manufactured, these values are set in the scale through the Graphical Caregiver Interface (GCI)® Control. The weight is corrected by the following ratio of the two values:

> Weight = weight measured*(gravity constant where calibrated)/(gravity constant where used)

If a bed is serviced and calibrated, set the gravity values accordingly (see “Changing Gravity Constants/Coefficients” on page 2-256). If the bed is calibrated and used at the same geographical location, the values will be the same, and the ratio is 1. When the ratio is 1, no correction to the weight reading is necessary.

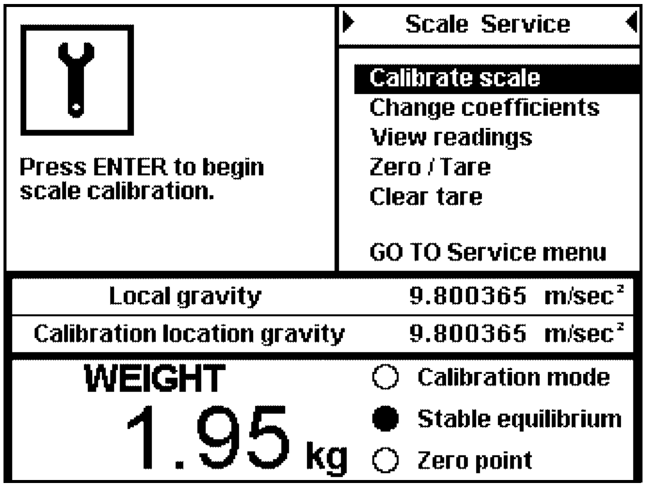
Changing Gravity Constants/Coefficients

1. Activate Calibration mode by performing the following:

NOTE:
Unless the scale is in Calibration mode, it will not accept new values from the Graphical Caregiver Interface (GCI)® Control and the gravity values **cannot** be modified.

   a. Break the seal on the scale board cover, and remove the scale board cover from the unit.
   b. At the scale P.C. board, press and hold the **Calibration** switch (SW1) for 10 seconds until two beeps sound and the **Calibration mode** indicator on the **Scale Service** screen comes on (see figure 2-11 on page 2-257). For more information on the functions of the **Scale Service** screen, refer to “Scale Service Screen Functions (NAWI Class IIII Scale—European Version Only)” on page 2-259.

Figure 2-11. Scale Service Screen



Scale Service

Calibrate scale
Change coefficients
View readings
Zero / Tare
Clear tare

GO TO Service menu

Press ENTER to begin scale calibration.

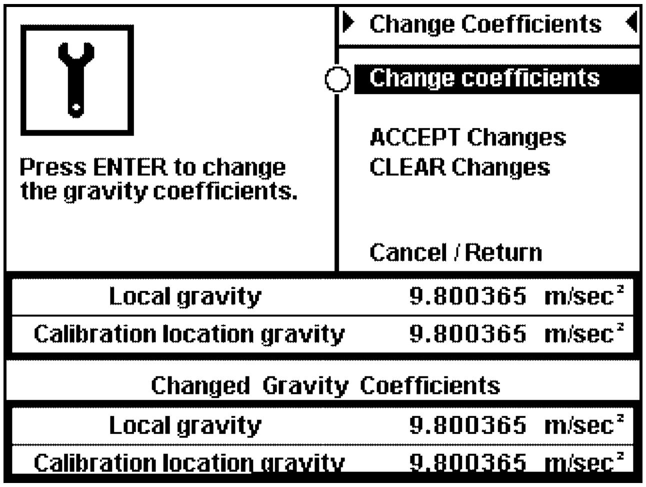
Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

WEIGHT
1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

2. At the **Scale Service** screen, scroll to *Change coefficients*, and press **Enter.** The **Change Coefficients** screen displays (see figure 2-12 on page 2-257). For more information on the **Change Coefficients** screen, refer to “Scale Service Screen Functions (NAWI Class IIII Scale—European Version Only)” on page 2-259.

Figure 2-12. Change Coefficients Screen



Change Coefficients

○ Change coefficients

ACCEPT Changes
CLEAR Changes

Cancel / Return

Press ENTER to change the gravity coefficients.

Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

Changed Gravity Coefficients

Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

3. Check the **Local gravity** and **Calibration location gravity** values.

4. To change the gravity coefficients, perform the following at the **Change Coefficients** screen:
    a. Scroll to *Change coefficients*, and press **Enter**.
    b. Change the **Changed Gravity Coefficients** values to the desired gravity constants. For examples of some gravity constants for different locations, refer to table 2-21 on page 2-255.
    c. Perform **one** of the following:
        - To **clear** changes, scroll to *CLEAR Changes*, and press **Enter**.
        - To **cancel** changing the gravity coefficients and return to the **Scale Service** screen, scroll to *Cancel/Return*, and press **Enter**.
        - To **accept** changes, scroll to *ACCEPT Changes*, and press **Enter**.
    d. After accepting changes to the gravity coefficients, verify that the current **Local gravity** and **Calibration location gravity** values match the **Changed Gravity Coefficients** values.
    e. Calibrate the NAWI Class IIII Scale (European version) (refer to procedure 4.2).

NOTE:
If the scale P.C. board is replaced, the seal on the scale P.C. board breaks, and the scale **must** be calibrated.

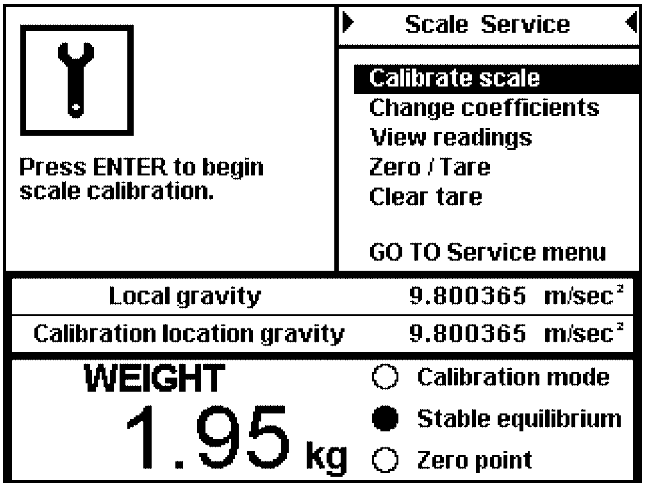
    f. Have Hill-Rom Technical Support or an approved agency verify the calibration. If the scale fails verification testing, go to RAP 2.68.

NOTE:
After a NAWI Class IIII Scale (European version) is calibrated, its calibration **must** be verified by Hill-Rom or an approved agency.

Scale Service Screen Functions (NAWI Class IIII Scale—European Version Only)

Scale Service Screen

Figure 2-13. Scale Service Screen


Scale Service
Calibrate scale
Change coefficients
View readings
Zero / Tare
Clear tare
GO TO Service menu
○ Calibration mode
● Stable equilibrium
○ Zero point

Press ENTER to begin scale calibration.

Local gravity	9.800365 m/sec^2
Calibration location gravity	9.800365 m/sec^2

WEIGHT
1.95 kg

Functions

At the **Scale Service** screen, you may perform the following functions:

- To calibrate the scale, scroll to *Calibrate scale*, and press **Enter**.
- To view or change the gravity coefficients, scroll to *Change coefficients*, and press **Enter**. Refer to “Change Coefficients Screen” on page 2-261.
- To view additional data from the scale, such as A/D readings and calibration information, scroll to *View readings*, and press **Enter**. Refer to “Scale Service—View Readings Screen” on page 2-262.
- To tare the scale, scroll to *Zero/Tare*, and press **Enter**.
- To clear all tare values, scroll to *Clear tare*, and press **Enter**.
- To return to the **Service** screen, scroll to *GO TO Service menu*, and press **Enter**.

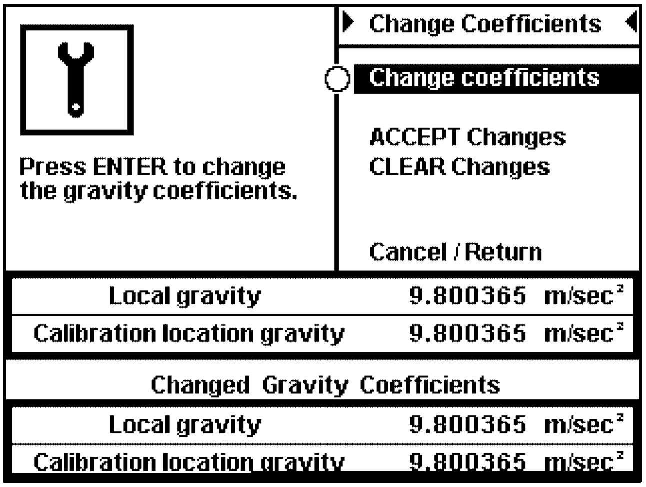
Indicators

The following indicators appear on the **Scale Service** screen:

- The **Calibration mode** indicator illuminates when the **Calibration** switch (SW1) on the scale P.C. board is activated.
- The **Stable equilibrium** indicator illuminates if the weight readings vary only 0.5 kg for 5 seconds.
- The **Zero point** indicator illuminates after a zero tare function if the weight is within 0.125 kg of the zero tare value.

Change Coefficients Screen

Figure 2-14. Change Coefficients Screen



Press ENTER to change the gravity coefficients.

Local gravity	9.800365	m/sec^2
Calibration location gravity	9.800365	m/sec^2

Changed Gravity Coefficients

Local gravity	9.800365	m/sec^2
Calibration location gravity	9.800365	m/sec^2

Functions

At the **Change Coefficients** screen, you may perform the following functions:

- To enable changing the **Changed Gravity Coefficients** values, scroll to *Change coefficients*, and press **Enter**.

NOTE:
The **Calibration mode** indicator must be on to enable changing the gravity values.

- To clear changes, scroll to *CLEAR Changes*, and press **Enter**.
- To accept changes, scroll to *ACCEPT Changes*, and press **Enter**.
- To cancel changing the gravity coefficients and return to the **Scale Service** screen, scroll to *Cancel/Return*, and press **Enter**.

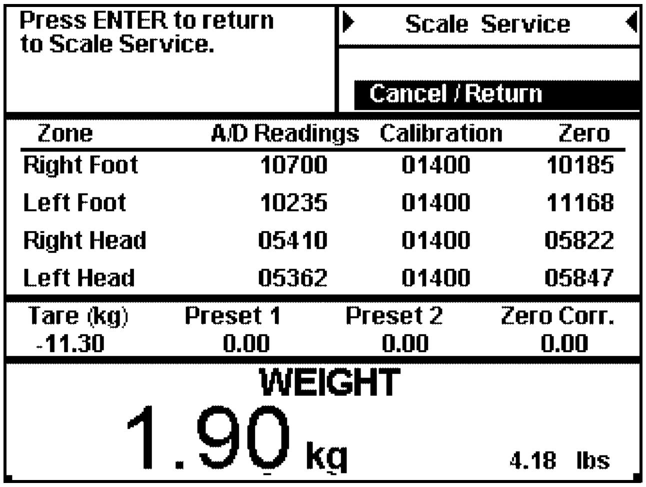
Values

The following values appear on the **Change Coefficients** screen:

- **Local gravity** indicates the current value for the local gravity value stored in the scale P.C. board.
- **Calibration location gravity** indicates the current value for the calibration location gravity value stored in the scale P.C. board.

Scale Service—View Readings Screen

Figure 2-15. Scale Service—View Readings Screen



Press ENTER to return to Scale Service.

Zone	A/D Readings	Calibration	Zero
Right Foot	10700	01400	10185
Left Foot	10235	01400	11168
Right Head	05410	01400	05822
Left Head	05362	01400	05847

Tare (kg)	Preset 1	Preset 2	Zero Corr.
-11.30	0.00	0.00	0.00

WEIGHT

1.90 kg 4.18 lbs

Values

The following values appear on the **Scale Service—View Readings** screen:

- **Weight** indicates the weight on the bed, in 0.05 kg resolution.
- **Zone** indicates the load beam or signal channel, as defined as the patient's reference to the left or right side. For example, the right foot load beam is the same side as the patient's right when the patient is laying in the bed.
- **A/D Readings** indicates the signal readings from the load beams. If weight is added above a load beam, the A/D readings increase.
- **Calibration** indicates the calibration values stored in the scale after it is calibrated. For example, the value **1400** represents 140 counts/kg.
- **Zero** indicates the zero point values recorded during calibration and the weight on the bed **prior** to calibration.
- **Tare** indicates the tare value after a zero tare function.
- **Preset1** indicates the tare value from an autocompensation operation.
- **Preset2** indicates the tare value from adding and removing TotalCare SpO_2RT® Pulmonary Therapy System rotation and percussion modules after the bed is tared.
- If the weight on the bed is between 0 kg and -8 kg after the bed is calibrated, **Zero-Corr.** indicates the zero correction part of the zero tare function.

Hydraulic System Malfunction ("C" Model and Newer)

If a problem with the hydraulic system is readily identified, refer to table 2-22 on page 2-263 to quickly determine an applicable troubleshooting solution.

Table 2-22. Hydraulic System Malfunction

Condition	Possible Cause	Solution
The head cylinder does not move up.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S7) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S7) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
	The valve (S8) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The CPR valve (A) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.
The head cylinder moves up slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S8) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The CPR valve (A) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.
	#1 P.C. has contamination in its orifice.	Replace the hydraulic power unit.
The head cylinder drifts down.	The valve (S8) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The CPR valve (A) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.

Condition	Possible Cause	Solution
The head cylinder does not move down.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S8) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S8) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The head cylinder moves down slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S8) has contamination in its seat orifice (see figure 2-16 on page 2-270).	Remove and clean the valve seat orifice.
The head cylinder moves up unintentionally.	The valve (S7) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The knee cylinder does not move up.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S5) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S5) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
	The valve (S6) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The knee cylinder moves up slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S6) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	#2 P.C. has contamination in its seat.	Replace the hydraulic power unit.
The knee cylinder drifts down.	The valve (S6) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.

Condition	Possible Cause	Solution
The knee cylinder does not move down.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S6) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S6) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The knee cylinder moves down slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S6) has contamination in its seat orifice (see figure 2-16 on page 2-270).	Remove and clean the valve seat orifice.
The knee cylinder moves up unintentionally.	The valve (S5) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The foot articulation cylinder does not move up.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S1) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S1) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The foot articulation cylinder moves up slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	Port 3 has contamination in its orifice (see figure 2-17 on page 2-271).	Remove and clean the orifice.
	#3 P.C. has contamination on its seat (see figure 2-17 on page 2-271).	Replace the hydraulic power unit.
The foot articulation cylinder drifts down.	POCV 3 has contamination on its seat (see figure 2-17 on page 2-271).	Replace the POCV.

Condition	Possible Cause	Solution
The foot retraction cylinder moves out slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	Port 5 has contamination in its orifice.	Remove and clean the orifice.
The foot articulation cylinder does not move down.	The hose is damaged.	Check the hose for kinks, leaks, or damage.
	POCV 3 and 5 are switched (see figure 2-17 on page 2-271).	Switch the POCVs.
	The valve coil (S2) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S2) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The foot articulation cylinder moves down slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	Port 3 has contamination in its orifice (see figure 2-17 on page 2-271).	Remove and clean the orifice.
	#3 P.C. has contamination on its seat (see figure 2-17 on page 2-271).	Replace the hydraulic power unit.
The foot retraction cylinder does not move out.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S3) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S3) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The foot retraction cylinder drifts out.	POCV 5 has contamination on its seat (see figure 2-17 on page 2-271).	Replace the POCV.

Condition	Possible Cause	Solution
The foot retraction cylinder does not move in.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S4) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S3) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The foot retraction cylinder moves in slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	#5 P.C. has contamination in its orifice (see figure 2-17 on page 2-271).	Replace the hydraulic power unit.
The foot hilow does not move up.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S1) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S1) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
	The valve (S12) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The foot hilow moves up slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S12) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	#8 P.C. has contamination in its orifice.	Replace the hydraulic power unit.

Condition	Possible Cause	Solution
The foot hilow drifts down.	The valve (S12) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The foot hilow does not move down.	The hose is damaged.	Check the hose for kinks, leaks, or damage.
	The valve coil (S12) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S12) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The foot hilow moves down slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage.
	The valve (S12) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	#8 P.C. has contamination in its orifice.	Replace the hydraulic power unit.
The foot hilow moves up unintentionally.	The valve (S11) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
The head hilow does not move up.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve coil (S9) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S9) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
	A washer is missing from POCV 7 (see figure 2-17 on page 2-271).	Install a washer on POCV 7.
	The valve (S10) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The Emergency Trendelenburg valve (B) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.

Condition	Possible Cause	Solution
The head hilow moves up slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S10) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The Emergency Trendelenburg valve (B) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.
	#9 P.C. has contamination in its orifice.	Replace the hydraulic power unit.
The head hilow drifts down.	The valve (S10) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	The Emergency Trendelenburg valve (B) has contamination on its seat (see figure 2-17 on page 2-271).	Remove and clean the valve seat.
The head hilow does not move down.	The hose is damaged.	Check the hose for kinks, leaks, or damage.
	The valve coil (S10) is defective (see figure 2-16 on page 2-270).	Perform an ohm check on the valve coil. Ensure that it is within the specification of 16 Ω to 18 Ω.
	The valve (S10) is defective (see figure 2-16 on page 2-270).	Swap the valve with a known good valve. If the problem continues, replace the valve.
The head hilow moves down slowly.	The hose is damaged.	Check the hose for kinks, leaks, or damage. If necessary, replace the hose.
	The valve (S10) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.
	#9 P.C. has contamination in its orifice.	Replace the hydraulic power unit.
The head hilow moves up unintentionally.	The valve (S9) has contamination on its seat (see figure 2-16 on page 2-270).	Remove and clean the valve seat.

Figure 2-16. Coils and Valves

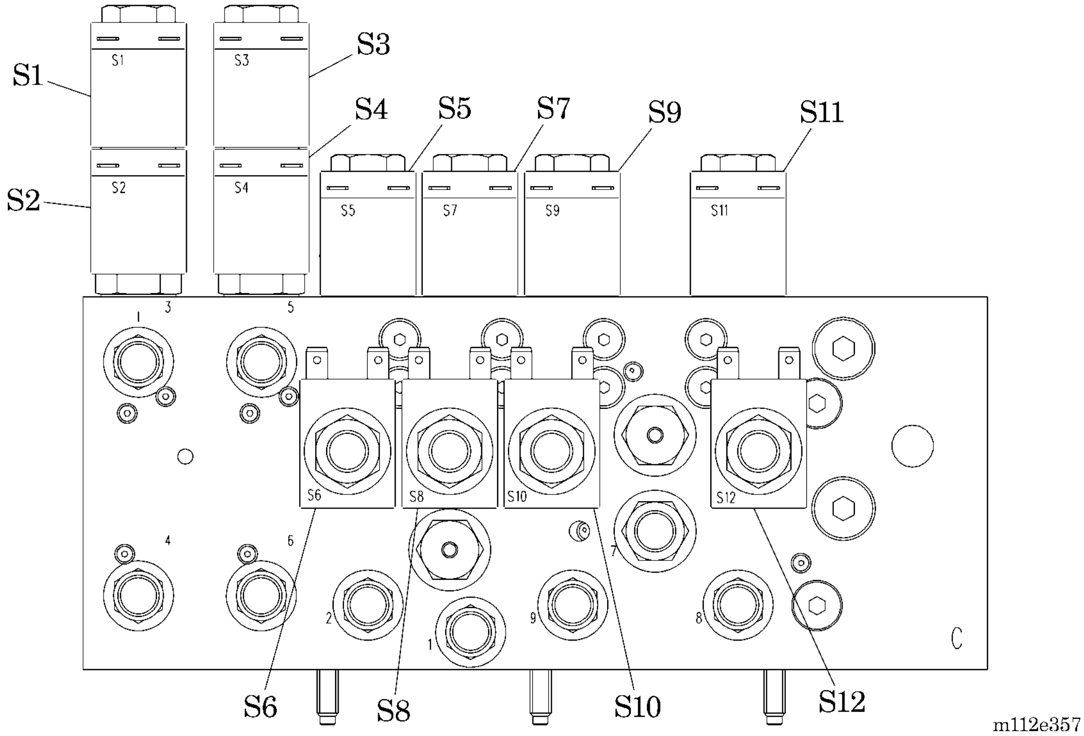
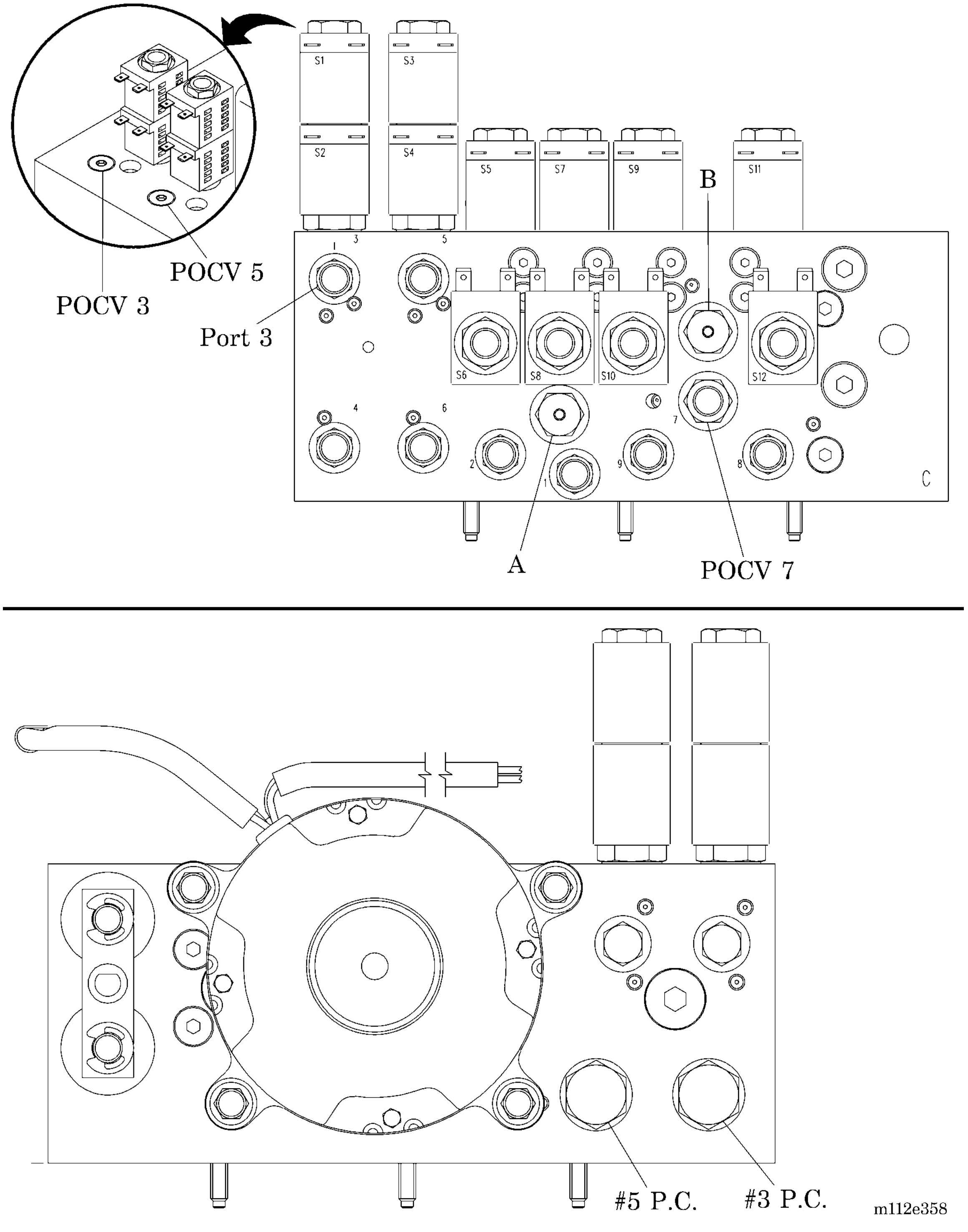

S1
S3
S4
S5
S7
S9
S11
S2
S6
S8
S10
S12
C
m112e357

Figure 2-17. Check Valves


POCV 5
POCV 3
Port 3
B
S1
S2
S3
S4
S5
S7
S9
S11
S6
S8
S10
S12
A
POCV 7
#5 P.C.
#3 P.C.
m112e358

Chapter 3
Theory of Operation

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System Wiring Diagram

Figure 3-1. System Wiring Diagram—120V (P/N 47030)

Refer to fold-out FO 3-1 at the rear of this manual.

Figure 3-2. System Wiring Diagram—230V (P/N 47030)

Refer to fold-out FO 3-9 at the rear of this manual.

Figure 3-3. System Wiring Diagram—100V/110V/127V (P/N 47030)

Refer to fold-out FO 3-36 at the rear of this manual.

Basic Description

The TotalCare® Bed System furnishes an articulated bed frame with a modular therapy care and sleep surface enabling caregivers to provide continuous patient care. The TotalCare® Bed System supplies a one-bed solution for acute patient care in the prevention and treatment of pressure ulcers.

The TotalCare® Bed System, a product of modular design, is comprised of mechanical, hydraulic, electrical, and air systems integrated into a flexible platform providing for the care of patients with comfort and ease. These systems are dependent and interrelated upon each other to provide continuous total system operation. The “Theory of Operation” sections provides a basic description of these primary systems.

Bed Frame

Base Frame Module

The base frame module consists of the base frame, casters, brake and steer components, and a lift mechanism. The module houses most of the components of the hydraulic system, air system, and electrical power system.

Intermediate Frame Module

The intermediate frame module connects the articulating deck/weigh frame module to the base frame lifting mechanism. With the Trendelenburg or diagnostic patient weight option present, the intermediate frame module becomes the platform on which scale system weight sensing components (load beams) are mounted. Anything attached to this frame is not weighed by the scale system. For this reason, IV Rods, drainage bag holders, and other accessories are attached to the intermediate frame.

Articulating Deck/Weigh Frame Module

The articulating deck/weigh frame module consists of a segmented deck, on which the sleep surface rests, and a supporting tubular steel frame. The deck is segmented into four sections: the head, the knee, the seat, and the retracting foot. These sections, with the exception of the seat section, may be moved under the caregiver’s control to change the patient’s positioning.

If the bed system is equipped with the optional scale system, any item placed on the articulating deck/weigh frame will be weighed.

Siderail Module

The Siderail Module (SM) consists of left and right head siderails and left and right intermediate siderails. In the up position, they are intended to make the patient aware of the proximity of the sleep surface edge. The siderails may be lowered below the patient surface to permit patients to enter or exit the bed, and to give a caregiver unobstructed access to the patient. Caregiver controls, patient controls, and entertainment modules are mounted on the siderails. The head siderails are mounted to the articulating deck head section, and the intermediate siderails are mounted to the weigh frame.

Headboard Module

The Headboard Module is a flat stationary panel vertically affixed to the weigh frame near the head end. The headboard's intended functions are:

- To keep items from slipping off the head end of the bed
- To keep items in the bed from bridging the weigh frame/intermediate frame.
- To provide an emergency CPR board

The headboard can be quickly removed in a single step, without tools, by a caregiver to perform CPR or to gain access to the patient's head from the head end.

Footboard Module

The Footboard Module (FM) is a panel located at the foot end. It is affixed to the foot section of the articulating deck in such a way that it remains perpendicular to the surface of the foot section. The footboard's intended functions are:

- To support the bottoms of the patient's feet in the chair and bed modes to prevent foot drop.
- To provide a surface for patients to use to reposition themselves.
- To provide grip areas for caregivers to use during transport.
- To keep the patient from slipping off the foot end.
- To deter unauthorized patient exit from the foot end.

Hydraulic System

Figure 3-4. Hydraulic System Diagram (P1900A and P1900B)

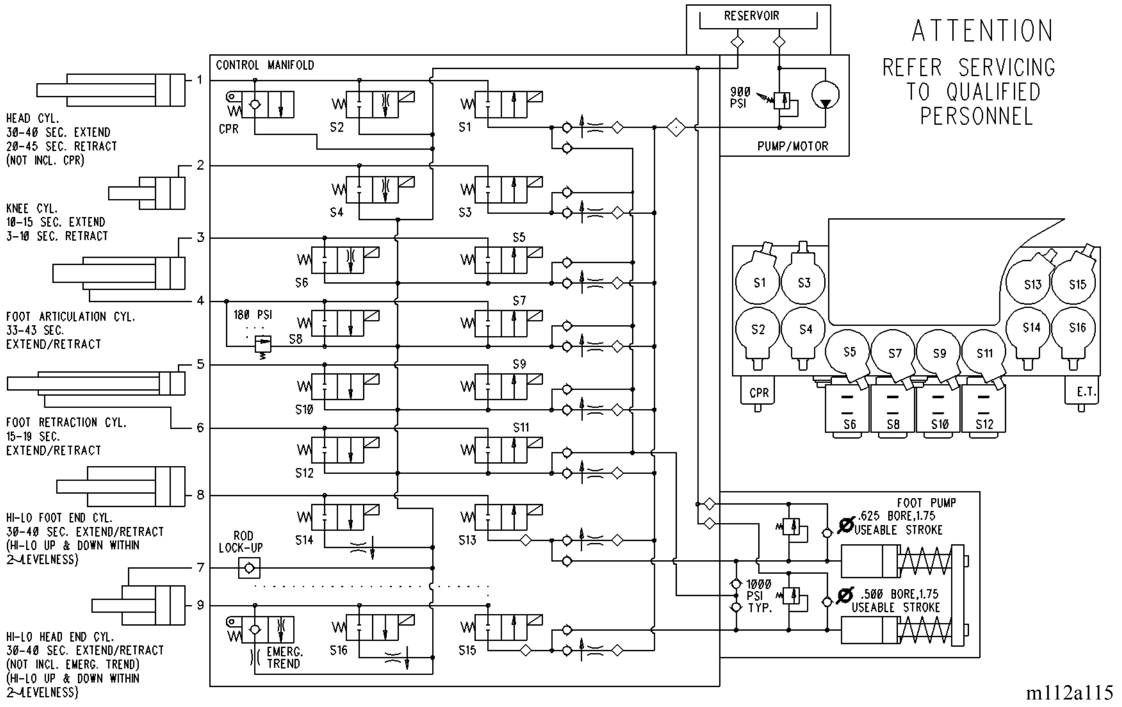
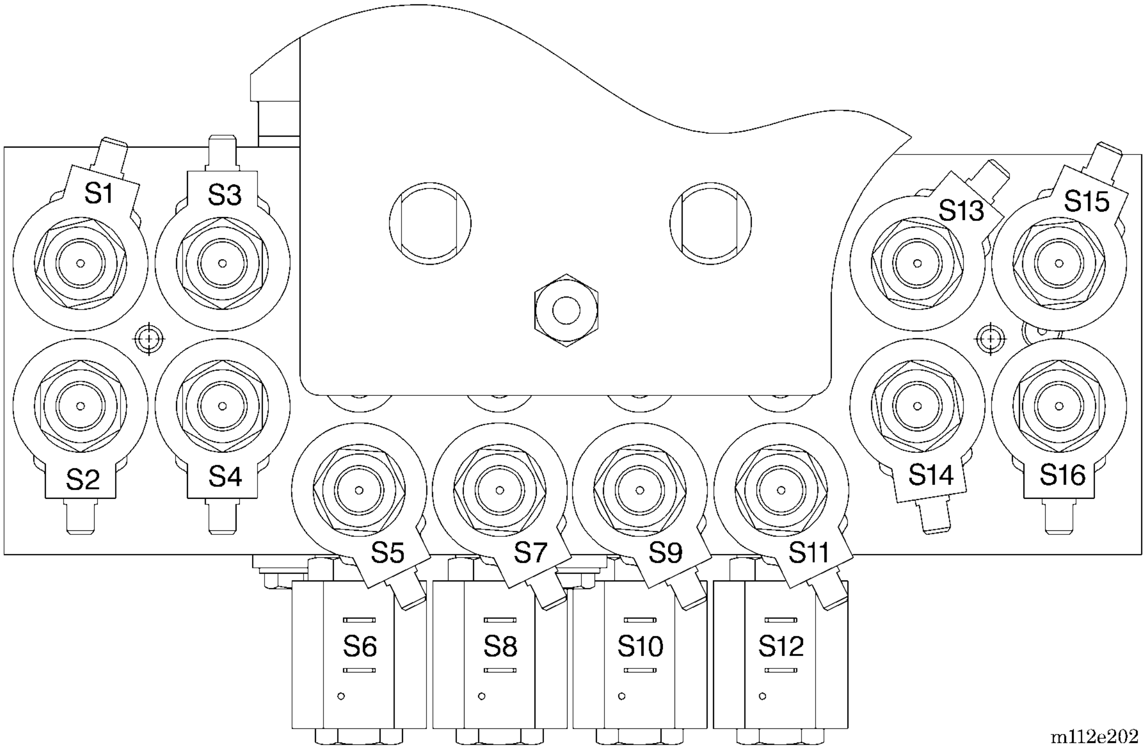

RESERVOIR
ATTENTION
REFER SERVICING TO QUALIFIED PERSONNEL
CONTROL MANIFOLD
900 PSI
PUMP/MOTOR
1
2
3
4
5
6
7
8
9
HEAD CYL.
30-40 SEC. EXTEND
20-45 SEC. RETRACT
(NOT INCL. CPR)
KNEE CYL.
10-15 SEC. EXTEND
3-10 SEC. RETRACT
FOOT ARTICULATION CYL.
33-43 SEC.
EXTEND/RETRACT
FOOT RETRACTION CYL.
15-19 SEC.
EXTEND/RETRACT
HI-LO FOOT END CYL.
30-40 SEC. EXTEND/RETRACT
(HI-LO UP & DOWN WITHIN
2° LEVELNESS)
HI-LO HEAD END CYL.
30-40 SEC. EXTEND/RETRACT
(NOT INCL. EMERG. TREND)
(HI-LO UP & DOWN WITHIN
2° LEVELNESS)
CPR
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
180 PSI
ROD LOCK-UP
EMERG. TREND
W
E.T.
FOOT PUMP
Ø .625 BORE, 1.75 USEABLE STROKE
Ø .500 BORE, 1.75 USEABLE STROKE
1000 PSI TYP.
m112a115

Figure 3-5. Hydraulic System Diagram (P1900C)

Refer to fold-out FO 3-12 at the rear of this manual.

Figure 3-6. Hydraulic Manifold—Wire Color Coding (P1900A and P1900B)


S1
S3
S13
S15
S2
S4
S14
S16
S5
S7
S9
S11
S6
S8
S10
S12
m112e202

For wire color coding by component, refer to table 3-1 on page 3-12.

Table 3-1. Hydraulic Manifold—Wire Color Coding (P1900A and P1900B)

Component	Function	Wire Color Coding
S1	Head up	Brown
S2	Head down	Red
S3	Knee up	Orange
S4	Knee down	Yellow
S5	Foot up A	Green
S6	Foot down B	Blue
S7	Foot down A	Violet
S8	Foot up B	Gray
S9	Foot out A	Black
S10	Foot in B	White/red
S11	Foot in A	Tan
S12	Foot out B	Pink
S13	Hilow foot up	White/black
S14	Hilow foot down	White/green
S15	Hilow head up	White/yellow
S16	Hilow head down	White/blue

Figure 3-7. Hydraulic Manifold—Wire Color Coding (P1900C)

Refer to fold-out FO 3-12 at the rear of this manual.

Basic Description

The hydraulic system provides power to articulate the patient deck of the bed system, including raising and lowering the bed. This system consists of a motor-driven pump, a valve manifold, a reservoir for hydraulic fluid, hoses, and hydraulic actuating cylinders.

With the bed system plugged into an appropriate power source, the hydraulic system is activated through the use of the caregiver controls. A bed system equipped with the battery option allows the caregiver to articulate the bed system by pumping the foot pedal while simultaneously holding in an articulation switch.

The hydraulic system is a closed system. It does not require fluid refill as part of the preventive maintenance. The hydraulic pump has an output of 0.33 gal/min (0.021_liter/sec) at approximately 500 psi (3447 kPa) and a full load torque (full bypass relief valve pump setting) of 900 psi (6205 kPa).

Theory of Operation

Power Unit

The hydraulic power unit pressurizes and distributes fluid to the hydraulic cylinders that articulate the frames of the bed system. This unit consists of a motor-driven pump, manifold, reservoir, and an optional foot pump. The bed system's power control module sends power to the pump motor and solenoid valves on the manifold in response to a user's activation of a siderail switch. The manifold valves are energized in order to direct the pressurized fluid from the pump to the appropriate cylinder, or to permit the fluid inside the cylinder to run back to the reservoir.

Two valves on the manifold are mechanically activated without any electrical power. These are for the emergency CPR and Trendelenburg function.

Cylinders

There are six hydraulic cylinders that articulate the frames of the bed system. Four of them— the head, the knee, and lift cylinders are powered in extension only. This causes the downward movement of the frames to depend on gravity, as the movements are not powered in the downward direction. The other two cylinders used for foot extension and articulation are powered both in extension and retraction.

Hydraulic Manifold Assembly

The manifold assembly selectively directs the hydraulic fluid flow to/from the actuating cylinders for bed system articulating functions: hilow (bed up/down), head up/down, knee up/down, foot in/out, foot up/down, Trendelenburg, Reverse Trendelenburg, CPR, and manual pump. The respective actuating cylinders hold these functions at any specified position.

The manifold consists of eight (models A, B) six (model C) **up** or **raise** solenoid operated cartridge valves that are interchangeable from function to function, and eight (models A, B) six (model C) **down** or **lower** solenoid operated cartridge valves that are not interchangeable from function to function. Ten (models A, B) eight (model C) flow control, pressure-compensated valves (P.C. valves) and 16 (models A, B) twelve (model C) isolation check valves are non-serviceable items.

In bed raise operation, for the desired energized single-action function switch (head, knee, etc.), the pump motor operates at the same time as the activated raise solenoid valve. For the desired energized double-action function switch (foot articulation up/down and foot in/out, etc.), a return solenoid valve operates with an activated raise solenoid and pump motor. The hydraulic oil flows through the P.C. valve, the raise solenoid valve, and the actuating cylinder. The cylinder rod extends. The P.C. valve allows a fixed rate of fluid flow to pass through the raise solenoid valve that compensates for a loaded or empty bed. Each P.C. valve function has its own unique flow rate that is factory-set and not adjustable in the field. Using more than one function at a time does not affect the actuating cylinder speed rate. A rod, lock-up valve keeps the head actuating cylinder from extending when the foot end of the bed system is loaded. An isolation check valve is installed before each solenoid valve and after the pump. This valve keeps oil from flowing back through the pump when the solenoid valve is energized and the pump is not running.

In bed down operation, the down solenoid valve energizes. This action opens the down valve and allows oil to flow out of the cylinder through the down valve to the tank. Built into the down valve seat is a calibrated restrictor orifice to control the down speed. A P.C. valve controls the hilow function down speed. A filter screen on the down valve protects the orifice and keeps the P.C. valve from plugging. The maximum opening on the filter screen is 0.009" (0.23 mm). The load on the bed system does not affect the down speed, except head and knee, and using more than one function at a time does not affect the actuating cylinder down speed rate. Each function has its own unique restrictor orifice or P.C. valve. The solenoid valves are not interchangeable.

Single acting functions: the up and down solenoid valves are normally closed, 2-way valves. These valves are designed and factory-tested for zero leakage across the seat.

Double acting foot functions: normally closed 3-position, 4-way valves with pilot pressure operated check valves. In the non-energized or normal condition, these valves prevent the load from drifting. The mating parts are made of hardened steel.

CPR and Trendelenburg Release Valves

The CPR and Trendelenburg valves, normally closed ball check (models A, B) and soft seat (model C) valves, unseat against pressure by means of a mechanically operated linkage that pulls the release pin. These two release valves on the bed system are on the front of the manifold.

One of the release valves on the patient left side of the manifold is the Trendelenburg valve. This valve allows hydraulic oil from the head hilow actuating cylinder back to the tank. The speed is preset and controlled by an orifice by lifting the pedal on the bed system to actuate the release valve.

The other release valve on the left-hand side of the manifold is the CPR valve. This valve allows hydraulic oil from the head cylinder back to the tank. The speed is preset and controlled by an orifice. Depressing the pedal on the bed system actuates the CPR function.

Manual Hydraulic Control

The hydraulic foot pump raises the bed when wall outlet power is not present. It is not necessary to use the hydraulic foot pump for head down, knee down, or bed down functions. The appropriate caregiver control switch lowers the selected function.

The raise bed functions are executed by pumping the manual hydraulic control foot pedal until the bed system reaches the desired position. The battery option allows use of the appropriate caregiver controls.

Motor (100V/110V Only)

The 120V hydraulic pump motor used with a 100 mfd capacitor has the following specifications:

- 90V to 110V AC, 60/50 Hz
- 0.4 hp, 1750 rpm, single-phase
- Intermittent duty
- Thermal reset
- 5.5A—TRMS current at each full load
- Mechanically insulated from all metal parts

Motor (120V/127V Only)

The 120V hydraulic pump motor has the following specifications:

- 104V to 127V AC, 60/50 Hz
- 0.4 hp, 1750 rpm, single-phase
- Intermittent duty
- Thermal reset
- 5.5A—TRMS current at each full load
- Mechanically insulated from all metal parts

Motor (220V/230V/240V only)

The 230V hydraulic pump motor has the following specifications:

- 207V to 253V AC, 60/50 Hz
- 0.4 hp, 1550/1325 rpm, single-phase
- Intermittent duty
- Thermal reset
- 2.8A—TRMS current at each full load
- Mechanically insulated from all metal parts

Electronic System

Basic Description

The electronic system includes modules, options, and accessories that are primarily made up of electronic components. Information flow between the electronic modules is primarily accomplished through the use of a twisted pair network channel. The modules are connected in a peer-to-peer fashion which enables any one module to directly communicate with another without the need for a master controller. Each module is then connected to its appropriate sensors or actuators to perform its specific function.

Basic Architecture

Power Control Module

The Power Control Module (PCM) resides in the base frame. It interfaces with the network and directly with the Bed Position Module. Primary functions of the Power Control Module are:

- To generate the necessary power sources needed by the electronic modules.
- To accept bed system articulation network commands, receive articulating deck section positions via the bed position module, and then control the hydraulic manifold solenoids and pump motor accordingly.
- To receive lockout status information from the network. Bed system articulation requests will be qualified with the caregiver and patient lockout status, present bed positions, and pre-determined logic control of bed system movements to determine which solenoids in the hydraulic manifold should be actuated.
- To provide power to the treatment surface air source motor. This module shall handle all possible AC supply voltage inputs including all international requirements.
- When the bed system is equipped with the battery control option, the power control module supplies power to operate the hydraulic solenoids and air manifold actuators when the bed system is not connected to AC supply.

Bed Position Module

The Bed Position Module (BPM) consists of position sensors, safety switches, an emergency Trendelenburg switch, a CPR switch, and a junction P.C. board. It interfaces directly with the power control module.

The junction P.C. board resides in the weigh frame with the sensors remotely mounted on the base frame lift arms and articulating deck section pivots.

Primary functions of the junction P.C. board are:

- To distribute power and the network channel data to all network nodes on the weigh frame and intermediate frame.
- To facilitate the signal distribution to the position sensors and safety switches on the upper frames.

User Control Module

The User Control Module (UCM) resides on the intermediate siderail and sends data to the network node. The caregiver control/indicator panel provides the following:

- Control switches and indicators for caregiver positioning, patient positioning, nurse calling, and lighting/entertaining selections
- Network node that controls the bed setup switches and indicators—including sleep surface, night light, patient control back light, and patient exit detection features
- P.C. board for the sleep surface, night light, and patient control back light features that are bundled together on unique overlays
- Network connection for the Graphical Caregiver Interface (GCI)® Control module

SideCom® Communication System Module

The SideCom® Communication System module provides the gateway between the network and standard 37-pin sub-miniature SideCom® Communication System interface. It resides in the intermediate frame and connects to the network node and the User Control Module.

Scale Module

The Scale Module (SM) provides the patient weighing feature, consisting of load sensors and electronics. It receives requests to perform various weighing tasks and to report the measurements back to the network node. The Scale Module resides in the intermediate frame. When the Trendelenburg or diagnostic patient weight option is present, the Intermediate Frame Module (IFM) is the platform where the weight sensing components (load beams) are mounted.

The Scale Module stores operational parameters in the non-volatile memory and achieves two levels of performance: Trendelenburg level for basic trending of patient weight, and a diagnostic level for more demanding applications, such as measuring weight change during dialysis.

Schematic—Power Control Board

Figure 3-8. P.C. Board Wiring Diagram—Power Control Board (P/N 47040)

Refer to fold-out FO 3-2.1 thru FO 3-2.4 at the rear of this manual.

Schematic—Weigh Frame Junction

Figure 3-9. P.C. Board Wiring Diagram—Weigh Frame Junction (P/N 46994)

Refer to fold-out FO 3-3 at the rear of this manual.

Schematic—Scale Instrument

Figure 3-10. P.C. Board Wiring Diagram—Scale Instrument (P/N 47038)

Refer to fold-out FO 3-4 at the rear of this manual.

Schematic—Graphical Caregiver Interface (GCI)® Control

Figure 3-11. P.C. Board Wiring Diagram—Graphical Caregiver Interface (GCI)® Control (P/N 47035)

Refer to fold-out FO 3-5.1 and FO 3-5.2 at the rear of this manual.

Schematic—UCM Right Caregiver

Figure 3-12. P.C. Board Wiring Diagram—UCM Right Caregiver (P/N 47357)

Refer to fold-out FO 3-6.1 and FO 3-6.2 at the rear of this manual.

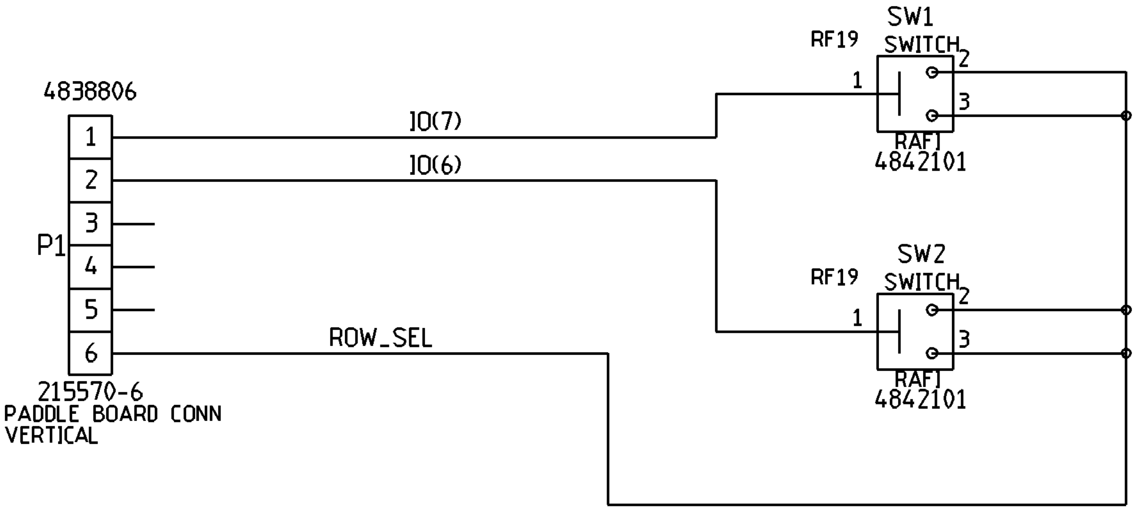
Schematic—UCM Left Caregiver

Figure 3-13. P.C. Board Wiring Diagram—UCM Left Caregiver (P/N 47360)

Refer to fold-out FO 3-7.1 and FO 3-7.2 at the rear of this manual.

Schematic—UCM Position and Enter

Figure 3-14. P.C. Board Wiring Diagram—UCM Positioning and Enter (P/N 48392)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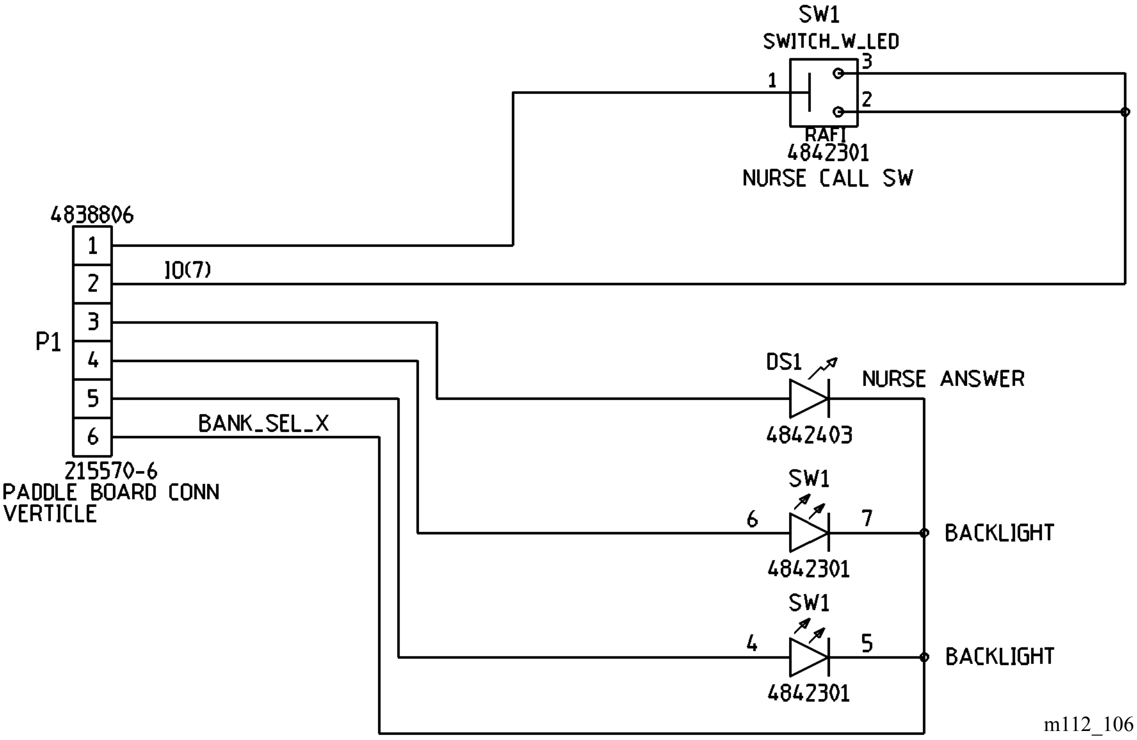
RF19
SWITCH
1
2
3
RAFI
4842101
4838806
1
2
3
4
5
6
P1
IO(7)
IO(6)
ROW_SEL
215570-6
PADDLE BOARD CONN
VERTICAL
SW2
RF19
SWITCH
1
2
3
RAFI
4842101

m112_101

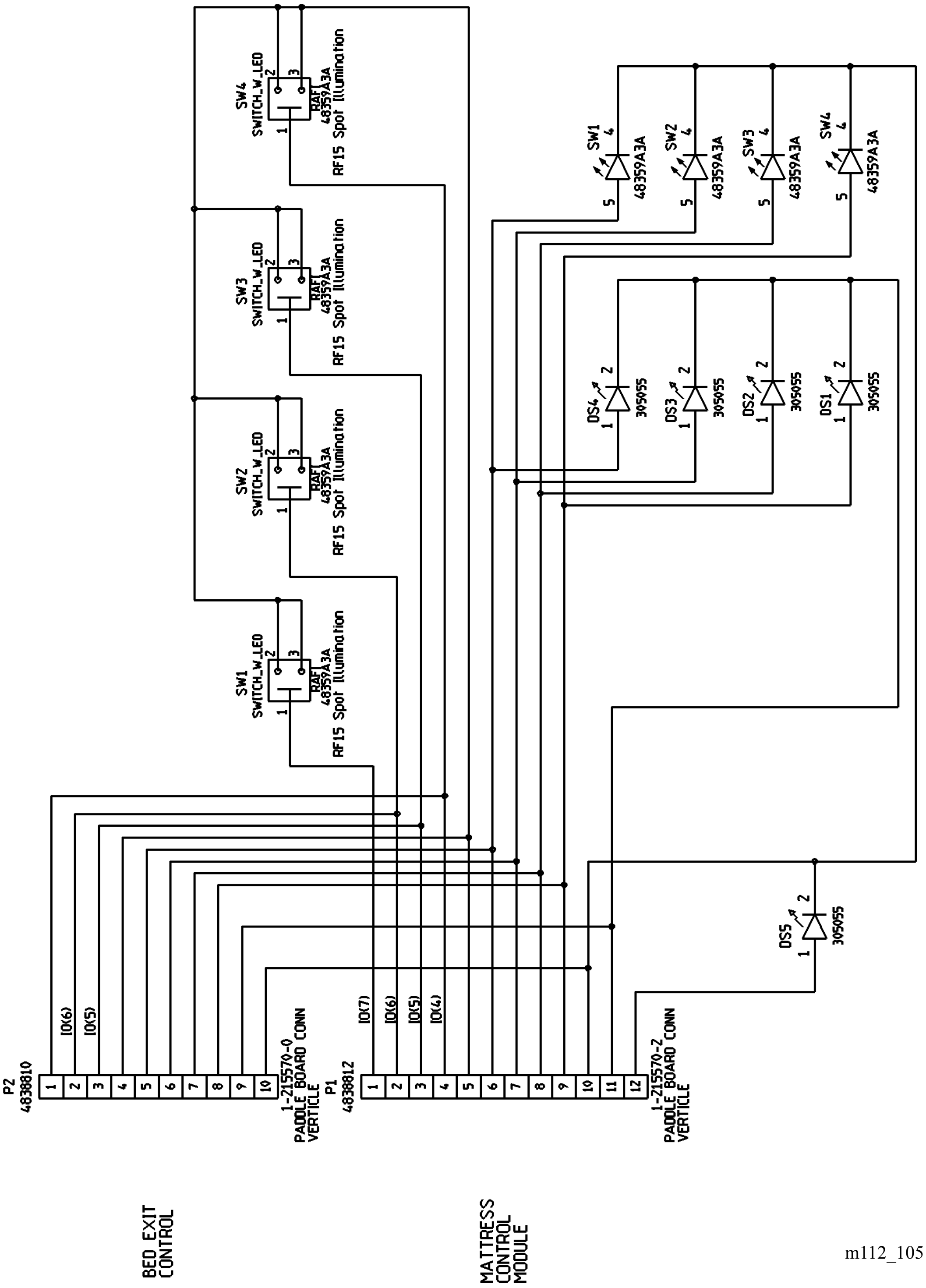
Schematic—UCM Nurse Call

Figure 3-15. P.C. Board Wiring Diagram—UCM Nurse Call (P/N 47420)


SW1
SWITCH_W_LED
3
1
2
RAFI
4842301
NURSE CALL SW
4838806
1
2
IO(7)
3
P1
4
5
6
BANK_SEL_X
215570-6
PADDLE BOARD CONN
VERTICLE
DS1
NURSE ANSWER
4842403
SW1
6
7
BACKLIGHT
4842301
SW1
4
5
BACKLIGHT
4842301
m112_106

Schematic—UCM Bed Exit

Figure 3-16. P.C. Board Wiring Diagram—UCM Bed Exit (P/N 47056)


SW4
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW3
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW2
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW1
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
1
2
3
SW1 4 5 48359A3A
SW2 4 5 48359A3A
SW3 4 5 48359A3A
SW4 4 5 48359A3A
DS4 1 2 305055
DS3 1 2 305055
DS2 1 2 305055
DS1 1 2 305055
DS5 1 2 305055
P2
4838810
IO(6)
IO(5)
1 2 3 4 5 6 7 8 9 10
1-215570-0
PADDLE BOARD CONN
VERTICLE
P1
4838812
IO(7)
IO(6)
IO(5)
IO(4)
1 2 3 4 5 6 7 8 9 10 11 12
1-215570-2
PADDLE BOARD CONN
VERTICLE
BED EXIT CONTROL
MATTRESS CONTROL MODULE
m112_105

Schematic—SideCom® Communication System

Figure 3-17. P.C. Board Wiring Diagram—SideCom® Communication System (P/N 47376)

Refer to fold-out FO 3-8 at the rear of this manual.

Schematic—Bed Function Wiring Schematic Diagram

Figure 3-18. Bed Function Wiring Schematic Diagram

Refer to fold-out FO 3-10 at the rear of this manual.

Schematic—TFSCM and TSCM

Figure 3-19. P.C. Board Wiring Diagram—TFSCM (P/N 4847101) and TSCM (P/N 484847401)

Refer to fold-out FO 3-11 at the rear of this manual.

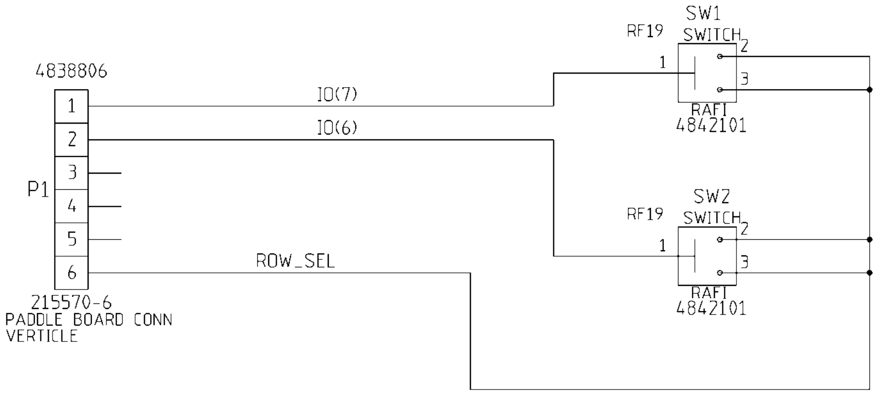
Schematic—Pulmonary System (Pulmonary Model)

Figure 3-20. Wiring Diagram—Pulmonary System (Pulmonary Model)

Refer to fold-out FO 3-13 at the rear of this manual.

Schematic—Enhanced Entertainment

Figure 3-21. Enhanced Entertainment

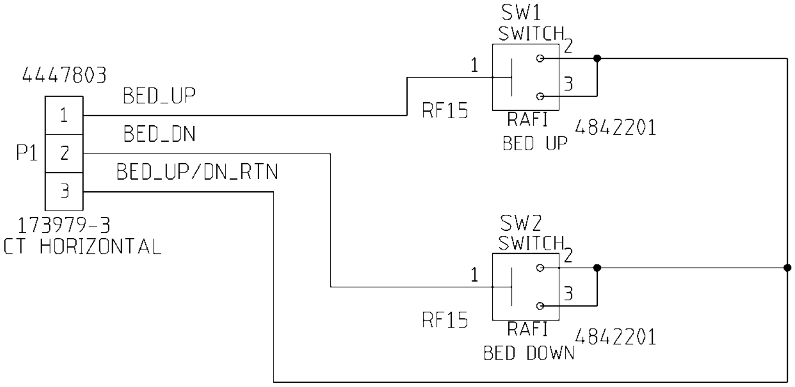


4838806
P1
1
2
3
4
5
6
IO(7)
IO(6)
ROW_SEL
215570-6
PADDLE BOARD CONN
VERTICLE
SW1
RF19
SWITCH
1
2
3
RAFI
4842101
SW2
RF19
SWITCH
1
2
3
RAFI
4842101

m112c304

Schematic—Bed Up/Down

Figure 3-22. Bed Up/Down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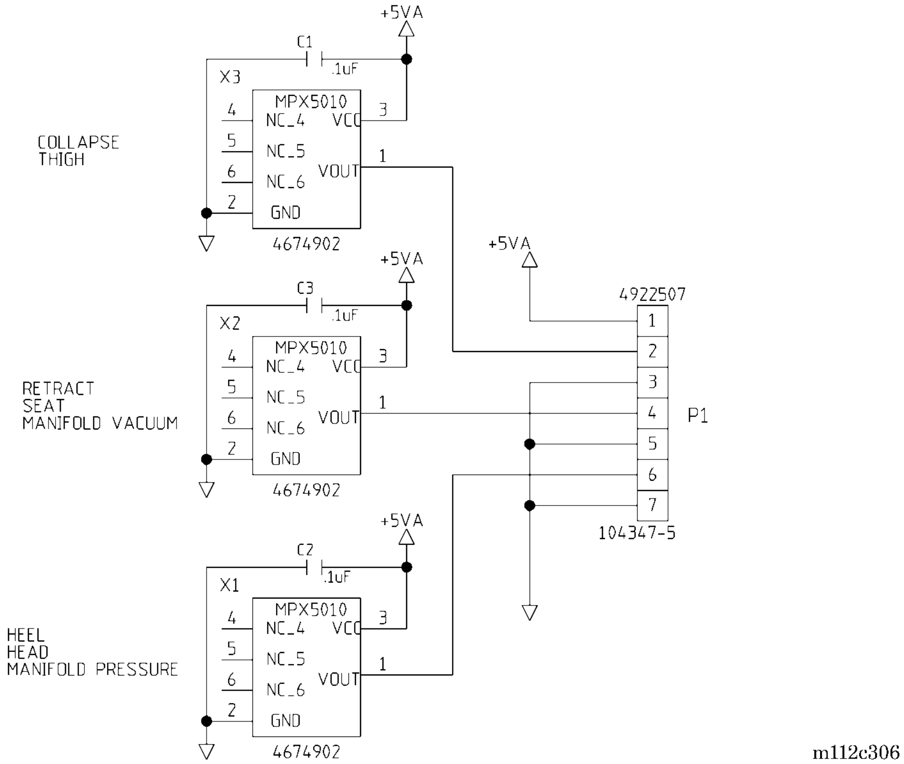
SWITCH
1
2
3
RF15
RAFI
BED UP
4842201
4447803
BED_UP
BED_DN
BED_UP/DN_RTN
P1
1
2
3
173979-3
CT HORIZONTAL
SW2
SWITCH
1
2
3
RF15
RAFI
BED DOWN
4842201

m112c305

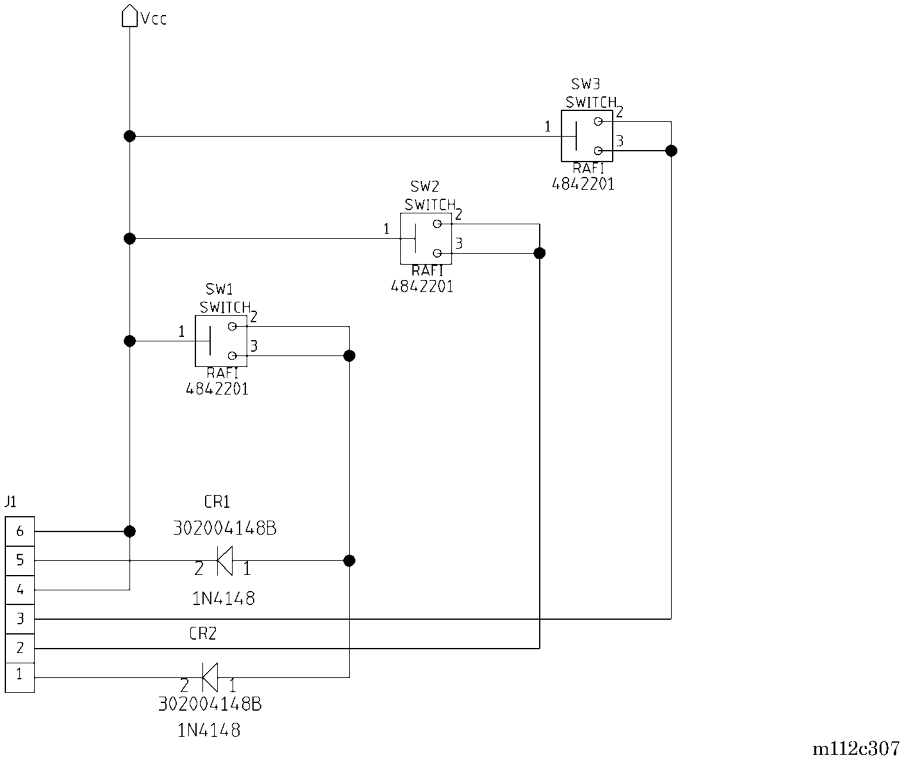
Schematic—Transducer

Figure 3-23. Transducer


+5VA
C1
.1uF
X3
MPX5010
NC_4
NC_5
NC_6
GND
VCC
VOUT
4674902
COLLAPSE
THIGH
C3
X2
RETRACT
SEAT
MANIFOLD VACUUM
C2
X1
HEEL
HEAD
MANIFOLD PRESSURE
4922507
P1
104347-5
m112c306

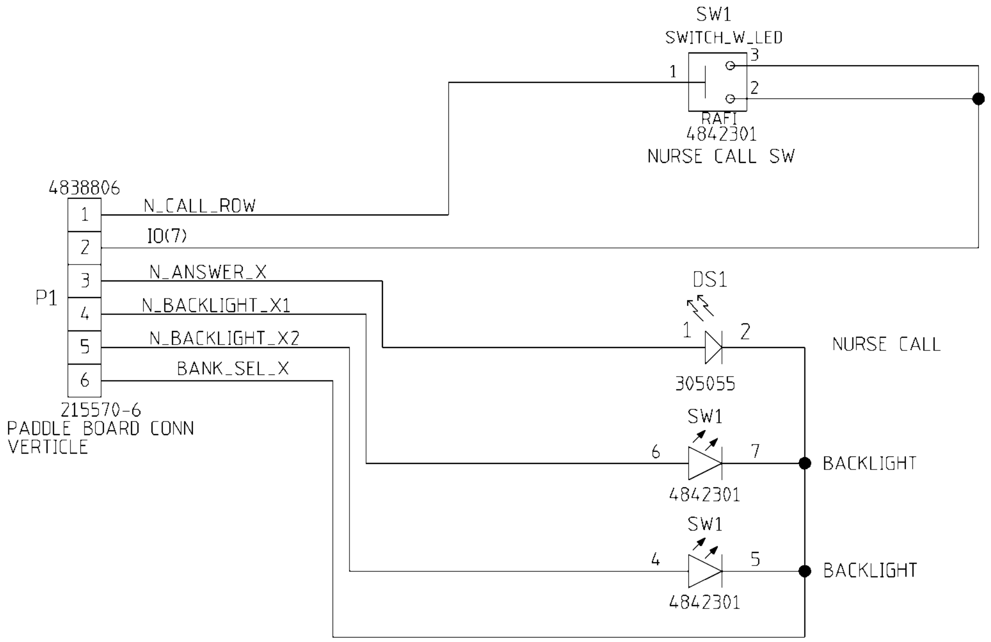
Schematic—Graphical Caregiver Interface (GCI)® Switch Module

Figure 3-24. Graphical Caregiver Interface (GCI)® Switch Module


Vcc
SW3
SWITCH
1
2
3
RAFI
4842201
SW2
SWITCH
1
2
3
RAFI
4842201
SW1
SWITCH
1
2
3
RAFI
4842201
J1
6
5
4
3
2
1
CR1
302004148B
2
1
1N4148
CR2
2
1
302004148B
1N4148
m112c307

Schematic—Nurse Call Module

Figure 3-25. Nurse Call Module


SW1
SWITCH_W_LED
3
1
2
RAFI
4842301
NURSE CALL SW
4838806
N_CALL_ROW
IO(7)
N_ANSWER_X
N_BACKLIGHT_X1
N_BACKLIGHT_X2
BANK_SEL_X
P1
1
2
3
4
5
6
215570-6
PADDLE BOARD CONN
VERTICLE
DS1
1
2
305055
NURSE CALL
SW1
6
7
4842301
BACKLIGHT
SW1
4
5
4842301
BACKLIGHT

m112c308

Schematic—Treatment Torso Module

Figure 3-26. Treatment Torso Module (P/N 65744)

Refer to fold-out FO 3-14.1 through 3-14.2 at the rear of this manual.

Schematic—Pulmonary Percussion Module

Figure 3-27. Pulmonary Percussion Module (P/N 66227)

Refer to fold-out FO 3-15 at the rear of this manual.

Schematic—Treatment Foot Module

Figure 3-28. Treatment Foot Module (P/N 64760)

Refer to fold-out FO 3-16.1 through 3-16.3 at the rear of this manual.

Schematic—Pulmonary Power Distribution

Figure 3-29. Pulmonary Power Distribution (P/N 48446)

Refer to fold-out FO 3-17 at the rear of this manual.

Schematic—Pulmonary Hardpanel

Figure 3-30. Pulmonary Hardpanel (P/N 60390)

Refer to fold-out FO 3-18 at the rear of this manual.

Schematic—Weighframe Junction

Figure 3-31. Weighframe Junction (P/N 46992)

Refer to fold-out FO 3-19 at the rear of this manual.

Schematic—Graphical Caregiver Interface (GCI)® Control

Figure 3-32. Graphical Caregiver Interface (GCI)® Control (P/N 47033)

Refer to fold-out FO 3-20.1 through 3-20.2 at the rear of this manual.

Schematic—Scale

Figure 3-33. Scale (P/N 47036)

Refer to fold-out FO 3-21 at the rear of this manual.

Schematic—BPCM/Power Supply

Figure 3-34. BPCM/Power Supply (P/N 47039)

Refer to fold-out FO 3-22.1 through 3-22.4 at the rear of this manual.

Schematic—Bed Exit Detect/Mattress Control

Figure 3-35. Bed Exit Detect/Mattress Control (P/N 47054)

Refer to fold-out FO 3-23 at the rear of this manual.

Schematic—Right-Side User Control Module

Figure 3-36. Right-Side User Control Module (P/N 47355)

Refer to fold-out FO 3-24.1 through 3-24.2 at the end of this manual.

Schematic—Entertainment Lighting Board

Figure 3-37. Entertainment Lighting Board (P/N 48434)

Refer to fold-out FO 3-25 at the rear of this manual.

Schematic—Treatment Surface Control Module

Figure 3-38. Treatment Surface Control Module (P/N 48522)

Refer to fold-out FO 3-26 at the rear of this manual.

Schematic—SideCom® Communication System Module

Figure 3-39. SideCom® Communication System Module (P/N 47374)

Refer to fold-out FO 3-27 at the rear of this manual.

Schematic—SideCom® Communication System with COMposer® Communication System

Figure 3-40. SideComm® Communication System with COMposer® Communication System (P/N 64077)

Refer to fold-out FO 3-28 at the rear of this manual.

Schematic—Treatment Foot Surface Control Module

Figure 3-41. Treatment Foot Surface Control Module (P/N 47396)

Refer to fold-out FO 3-29 at the rear of this manual.

Schematic—Treatment Foot Surface Control Module

Figure 3-42. Treatment Foot Surface Control Module (P/N 48469)

Refer to fold-out FO 3-30 at the rear of this manual.

Schematic—Patient Articulation/Entertainment

Figure 3-43. Patient Articulation/Entertainment (P/N 48390)

Refer to fold-out FO 3-31 at the rear of this manual.

Schematic—Torso Control Module

Figure 3-44. Torso Control Module (P/N 48472)

Refer to fold-out FO 3-32 at the rear of this manual.

Schematic—Left-Side User Control Module

Figure 3-45. Left-Side User Control Module (P/N 47354)

Refer to fold-out FO 3-33.1 through 3-33.2 at the rear of this manual.

System Wiring Diagram—TotalCare® Bed System—120V (P1900D)

Figure 3-46. TotalCare® Bed System—120V (P/N 47030) (P1900D)

Refer to fold-out FO 3-34 at the rear of this manual.

System Wiring Diagram—IntelliDrive® Transport System

Figure 3-47. IntelliDrive® Transport System

Refer to fold-out FO 3-35 at the rear of this manual.

Power Control Module

Basic Description

The Power Control Module is divided into two primary sections: the power supply, and positioning and power monitoring. The power supply consists of the power control P.C. board, transformer, line filter, full-wave bridge assembly, and battery. The positioning and power monitoring consists of the power control module P.C. board and solenoid actuator coils. The power control module resides in the base frame module, interfaces with the network, and communicates directly with the bed positioning module.

As a primary function, the power control module supplies the necessary power voltages needed by other electronic modules. Additional functions accept bed articulation network commands, receive articulating deck/weigh frame positions through the bed positioning module, and control the hydraulic manifold solenoids and pump motor. Also, the power control module accepts lockout status information from the network. Bed articulation requests, which position the solenoids in the hydraulic manifold, are qualified by the caregiver and patient lockout status, the present bed position, and a pre-determined logic control of bed movements. The power control module also provides power to the treatment surface air modules, and handles all AC supply voltage input requirements.

If the bed system is not connected to AC supply voltage, the power control module uses battery-supplied power to operate the hydraulic solenoids and air manifold actuators. The battery also powers the bed status indicators and nurse call feature.

Theory of Operation

Power Control Module P.C. Board

The power control module P.C. board converts AC power to DC power for distribution to all modules located in the base, intermediate, and articulating deck/weigh frames. It accepts articulation commands through the network, converting these commands to output functions that control bed movement through the solenoid actuator valves and hydraulic pump. The positioning and power monitoring segment sense and control power lines. Interface to the bed position module is provided by the signal distribution connector. Discrete connections on the weigh frame junction P.C. board are provided for base frame module linear sensors and safety switches. A pass-through connector provides access to the air blower assembly from the power control module.

Filter

The filter section contains 30,000 uf capacitance to filter the DC voltage provided by the transformer and the full-wave bridge rectifier. A resistor to ground provides a means to discharge the capacitors when AC power is removed. The analog-to-digital (A/D) converter on the power control module monitors the AC power input and indicates when the AC power is not present. The filter section output is 23V DC filtered at nominal line and full load conditions.

Battery Charger

The battery charger provides battery charging and battery condition monitoring for a 12V DC, 7.2A, sealed, lead-acid battery. The battery charger uses two modes to charge the battery: a **constan**t-**500 ma** mode when the battery is partially discharged, and a **float**-**condition** mode when the battery is nearly-fully charged. The power control module microprocessor determines when to charge the battery in the float-condition mode and instructs the charge disable line to shut off the current and stop battery charging. A test jack is available at the output of the battery charger that furnishes an accurate reading of the battery charge voltage.

Battery Latch Relay

The battery latch, single-pole, single-throw, relay disconnects the bed from the battery when the battery becomes approximately 50% discharged and the bed system is not connected to AC power. The battery, through battery latch relay contacts, disconnects to prevent the battery from becoming deeply discharged and to increase the life of the battery.

The battery latch relay also protects electronic components by interrupting the bed operation to maintain valid operation when module voltage falls below minimum input voltage. This dual-control latching relay reduces battery energy applied to relay coils and restricts use of the battery to the power control module. The power control module A/D converter monitors the battery voltage to determine the charged condition of the battery. A reverse-voltage diode minimizes damage if the battery is not properly installed.

8.5V Regulator

The 8.5Vregulator converts 23V DC or 12V battery voltage to 8.5V DC. The 23V DC and 12V battery voltages are rectified by a diode before being applied to the power control module circuit. The regulator keeps the power output at 8.5V DC without interruption if the bed is unplugged or a brownout occurs. The regulator converts voltage approximately 85% efficiency. If the duty cycle exceeds 95%, the regulator enables the short circuit protection (crowbar) circuit. The short protection circuit turns the FET off and keeps the short on the output from overstressing the FET. The power control module A/D converter monitors the 8.5V DC, and when the 8.5V DC is no longer being supplied, the A/D converter furnishes a signal to sound an audible alarm.

8.5V Crowbar

The 8.5V crowbar circuit monitors the output of the 8.5V regulator. In a single fault condition, if the FET shorts or the gate drive remains on, the 8.5V crowbar circuit limits the output of the 8.5V regulator to 27V DC. If the output voltage exceeds approximately 15V DC, the silicon controlled rectifier in the crowbar circuit draws enough current to open the 7A fuse that provides the FET with its nominal 23V DC. The crowbar circuit prevents any damage to the assemblies that use the 8.5V DC generated from the power control module.

15.5V Regulator

The 15.5V regulator converts 23V DC or 12V battery voltage to 15.5V DC. The 23V DC and 12V battery voltage is rectified by a diode before the input is applied to the power control module circuit. The regulator keeps the power output at 12 to 15.5V DC without interruption if the bed is unplugged or a brownout occurs. The regulator coverts voltage at approximately 85% efficiency. If the duty cycle exceeds 95%, the regulator enables the short circuit protection circuit. The short protection circuit turns the FET off and keeps the short on the output from overstressing the FET. The power control module A/D converter monitors the 15.5V DC, and when the 15.5V DC is no longer being supplied, the A/D converter furnishes a signal to the **Service required** indicator.

15.5V Crowbar

The 15.5V crowbar circuit monitors the output of the 15.5V regulator. In a single fault condition, if the FET shorts, or the gate drive remains on, the 15.5V crowbar circuit limits the output of the 15.5V regulator to 27V DC maximum. If output voltage exceeds approximately 20V DC, the silicon controlled rectifier in the crowbar circuit draws enough current to open the 10A fuse that provides the FET with its nominal 23V DC. This circuit prevents any damage to the assemblies that use the 15.5V DC generated from the 15.5V DC power control module circuit.

Night Light Control

The night light control turns the voltage on and off to the night light. The transformer supplies 14V AC to the power control module. A triac changes the voltage to on and off states. The **neuron** controls logic voltage levels through the logic control (FPGA).

Hydraulic Pump Motor Control

The hydraulic pump motor control turns the voltage on and off to the hydraulic pump motor. The hydraulic pump motor operates from AC line voltage. This circuit is isolated from the low voltage DC controls by a relay on the PCM.

Power Distribution

The power control module performs as a junction board for the AC line voltages. The primary fuse is located in this section and protects the following AC line components: Hydraulic pump motor, air blower motor, and the transformer that generates low level voltages required by the bed. The connectors are configured to ensure proper connection to the power control module board.

VBB/15V_VBAT Relay

The Double-Pole, Single-Throw (DPST) relay during battery operation allows the power control module to remove control module voltages that are not needed, except for the first 30 seconds to position control circuits after AC power removal. The **neuron** and the AC failure detection circuits directly control the VBB/15V_BAT relay.

AC Failure Detector

The AC failure detector recognizes when AC power has been removed from the bed. The AC failure detector provides an output logic level signal to the PIC microcontrollers to indicate a loss of AC power. When power failure indication is received, the PIC microcontroller notifies the **neuron** to turn off the VBB/15V_BAT relay. After restoration of AC power, the detector circuit also restarts the Pulse Width Modulation (PWM) circuit without disabling the short circuit protection.

Master Microcontroller (Neuron)

The master microcontroller consists of an echelon **neuron** that mediates the data transfer from the power control module to all other modules within the TotalCare® Bed System through the network transceiver via the signal distribution, LON expansion and scale/patient exit detection (PED) connectors. The primary function of the **neuron** is to control bed articulations through Pulse Width Modulation (PWM), solenoid-actuator, and controlled outputs from the logic control (FPGA). The **neuron** controls the on and off state of the VBB/ 15V_VBAT power supply. The **neuron** also provides the memory-mapped address signals and data flow through the logic control (FPGA) to/from the slave microcontrollers (PIC) parallel slave port. It also provides frequency control of the piezo audible alarm device, program control of FPGA, and SPI interface control to a serial EEPROM and patient exit detection module (PEDM). Finally, the **neuron** reads the status of each safety switch through the logic control (FPGA).

Serial EEPROM

The serial EEPROM stores critical data parameters that may be lost during power fluctuations. The **neuron** controls the serial EEPROM through the SPI bus interface.

Scale/PED Connector

The scale/PED connector interfaces with the Scale Module and Patient Exit Detection (PED) module. The **neuron** connects to the scale/PED P.C. boards through the SPI bus interface and LON expansion connectors.

LON Expansion Connector

The LON expansion connector provides an expansion capability for future module designs. It interfaces directly with the **neuron**.

Power Control Signals

The power control signals from the **neuron** and microcontroller (PIC) control the on/off states of the VBB/15V_VBAT relay, hydraulic pump, night light, and BATT VOLT relay.

Solenoid Voltage Supervisor (FET)

The Solenoid Voltage Supervisor (FET) provides single fault protection from circuit failure of unassisted articulated movement. It connects directly to 15V_VBAT and supplies voltage to the solenoid actuators through the high side switch. The microcontroller (PIC) controls the FET via request from the **neuron.** The FET enables closed loop control of the solenoid actuators. If the **neuron** fails, the microcontroller (PIC) disables the FET, turning off power to all solenoid actuators.

Piezo Device

The piezo device is the source of audible tones, providing audible tones at frequencies between 100 Hz to 4 kHz. It utilizes a redundant voltage supply VBAT diode or 15V_VBAT as short circuit protection. The **neuron** controls the piezo frequency and duty cycle.

Network Transceiver

The network transceiver provides the RS-485 network serial communication control signals to the signal distribution connector. The transceiver provides the communication interface from the power control module to all other modules connected to the LON network.

Slave Microcontroller (PIC)

The slave microcontroller's (PIC) primary function is normalizing position sensing information from the bed position module and monitoring power supply voltages. The position information channels through the analog multiplexer (MUX) from the switch and sensor connector and signal distribution connector. The slave microcontroller monitors the power monitoring and sensing signals. It provides the pulse width modulated (PWM) frequency to the logic control (FPGA). In addition, it directly drives the solenoid voltage supervisor (FET) for the solenoid high side voltage and drives the hydraulic pump upon requests from the **neuron**. If power fails, the slave microcontroller (PIC) notifies the **neuron**.

Power Monitoring and Sensing Signals

The power monitoring and sensing signals provided from the power supply section of the power control module are VBATT_15V_MON, BATT_VOLT_MON, VBATT_8.5V_MON, AC_FAIL, and BATTERY_STATE. These signals detect out-of-tolerance voltage conditions and generate indications for **Service required** and early warning statuses.

Patient Exit Sensor Connector

The Patient Exit Sensor connector provides VBB and 5V DC power and interfaces with low end patient exit sensors. The patient exit sensor output signals connect directly to the analog multiplexer (MUX), and then to the microcontroller (PIC), which monitors weight changes on the articulating deck/weigh frame and detects the weight change if a patient falls out of or exits from the bed.

Night Light Sensor Connector

The night light sensor connector provides 5V DC power and interfaces with the photo sensing device. The sensor output signal connects directly to the analog multiplexer (MUX), and then to the microcontroller (PIC) which detects the amount of ambient light within a patient environment, and controls the operation of the night light on/off switch.

Logic Control (FPGA)

The logic control (FPGA) provides the solenoid actuator control logic, safety switch interface, network termination interface, and night light control output. It mediates the protocol and data flow between the **neuron** and the microcontroller (PIC). The microcontroller (PIC) sends a Pulse Width Modulated (PWM) signal to the logic control (FPGA), which divides the PWM signal by 2 and selects for transmission, reception or processing (gates) the 12 solenoid output driver bits.

Solenoid MOSFET Drivers

The solenoid MOSFET drivers are **low** side n-channel switches that accept logic-level signals from the logic control (FPGA). Solenoid control bits turn the solenoid MOSFET drivers on or off through solenoid connectors that output to solenoid actuator pairs. A p-channel voltage supervisory MOSFET supplies **high** side power to the solenoid actuator coils. When disabled, the solenoid voltage supervisor (FET) overrides all solenoid MOSFET drivers in the circuit. The logic control (FPGA) and drivers allow the solenoid actuator coils to pull in with full supply current, and then drop down to a holding current. The logic control (FPGA) divides the pulse width modulated (PWM) signal provided by the microcontroller (PIC) into two time-sliced 31.25 kHz, 50% duty cycle PWM signals. This feature conserves the power supply and battery energy. The solenoid MOSFET drivers power the 16Ω, nominal, actuator coils. The pull-in current is approximately 1A and drops approximately 400 mA under PWM control.

Pulse Width Modulation (PWM)

The pulse width modulated (PWM) signal is a continuous 62.5 kHz, 87.5% duty cycle PWM signal from the microcontroller (PIC) that is sent to the logic control (FPGA). The PWM signal is divided by the logic control (FPGA) into two time-sliced 31.25 kHz, 50% duty cycle PWM signals. The PWM signals gate 12 solenoid output driver outputs. The **neuron** enables or disables the PWM signal.

Solenoid Actuator Connector

The solenoid actuator connector interfaces the low side switching voltages with the following solenoid actuator coils: Head Hilow Up, Head Hilow Down, Foot Hilow Up, Foot Hilow Down, Foot In, Foot Out, Foot Down, Foot Up, Knee Down, Knee Up, Head Up and Head Down. This connector also allows a signal common for the high side drive which means that individual high side commons are connected in a daisy chain configuration at the actuator through the solenoid actuator cable assembly.

Brake-Not-Set Switch Connector

This **Brake not set** safety switch connector provides 5V DC power and interfaces with the **Brake not set** safety switch, which detects if the brake mechanism is not engaged. The safety switch output goes to the logic control (FPGA), and then to the **neuron** which reads the signal status. The switch is on the base frame, but it is a component of the Bed Position Module, which is on the weigh frame.

Head/Foot Hilow Sensor Connector

This Head/Foot hilow connector provides 5V DC power and interfaces with the Head and Foot hilow position sensors. The sensor output signals connect directly to the analog multiplexer (MUX), and then to the microcontroller (PIC), which senses the position of Bed Hilow and Trendelenburg angles. The sensors are on the base frame, but they are components of the bed position module (BPM), which is on the weigh frame.

Analog Multiplexer (MUX)

The Power Control Module contains two 8-channel, analog multiplexer (MUX) devices for bed positioning and power monitoring. One of the two MUX devices receives linear positioning sensor inputs. The second MUX device receives data from monitored voltages, patient exit sensors, and the night light photo sensor. Each MUX device has two outputs that connect to Analog-to-Digital (A/D) converter input channels of the microcontroller (PIC).

VBAT Voltage

The power supply section of the power control module P.C. board produces the VBAT voltage that is nominally 8.5V DC. This voltage is present any time the bed is connected to an AC source. If the battery option is present, the battery supplies 8.5V DC for the VBAT voltage. The VBAT voltage supplies the power control module, scale module, and both caregiver positioning modules. The regulator voltage output goes through a protective fuse to the weigh frame junction P.C. board. The fuse protects the wiring in the bed and allows continued operation of the bed if the fuse opens. The remaining modules use different outputs to keep the bed operational.

VBB Voltage

The power supply section of the power control module P.C. board produces the VBB voltage that is nominally 8.5V DC. This voltage is present any time the bed is connected to an AC source. If the battery option is present, the VBB voltage remains present for an additional 30 seconds after the AC power is unplugged from the bed. This allows the modules that use the VBB voltage to return to a safe condition after loss of AC power. The regulator voltage output goes through normally-closed relay contacts and a protective fuse to the weigh frame junction P.C. board. The fuse protects the wiring in the bed and allows continued operation of the bed if the fuse opens. The remaining modules use different outputs to keep the bed operational.

15V_BAT Voltage

The power supply section of the power control module P.C. board produces the 15V_BAT voltage that is nominally 15.5V DC. This voltage is present any time the bed is connected to an AC source. If the battery option is present, the battery supplies 12V DC for the 15V_BAT voltage. The 15V_BAT voltage supplies the power control module, scale module, and both caregiver positioning modules. The 15V_BAT voltage output goes through a protective fuse to the weigh frame junction P.C. board. The fuse protects the wiring in the bed and allows continued operation of the bed if the fuse opens. The remaining modules use different outputs to keep the bed operational.

15V Voltage

The power supply section of the power control module P.C. board produces the 15V voltage that is nominally 15V DC. This voltage is present any time the bed is connected to an AC source. If the battery option is present, the 15V voltage remains present for an additional 30 seconds after the AC power is unplugged from the bed. This allows the modules that use the 15V voltage to return to a safe condition after loss of AC power. The regulator voltage output goes through normally-closed relay contacts and a protective fuse to the weigh frame junction P.C. board. The fuse protects the wiring in the bed and allows continued operation of the bed if the fuse opens. The remaining modules use different outputs to keep the bed operational.

5V Regulator

The 5V regulator converts the VBAT voltage produced by the power supply section of the power control module to a nominal voltage of 5V DC. The voltage regulator provides voltage for all logic devices residing in the positioning and power monitoring section of the power control module, as well as the night light and relays. It also provides the reference voltage to the analog-to-digital (A/D) converter in the slave microcontroller for position sensing and power monitoring. The signal distribution connector delivers supply voltages to the safety switches and position sensors in the Bed Position Module (BPM).

Power Monitor/Reset

The power monitor/reset line detects a low voltage output condition on the 5V power supply. When a low voltage condition or power supply fault occurs, the power monitor/reset line drives “low” and applies a low signal to the **neuron**, logic control (FPGA) and microcontroller (PIC). When the voltage trips after 350 ± 100 ms, the threshold drives the reset line to “high.” The threshold voltage is 4.5V DC.

Signal Distribution Connector

The signal distribution connector provides the signal and 5V DC interfaces to/from the bed position sensors and safety switches. It also provides connection to the LON network via the Bed Position Module (BPM) junction P.C. board. It routes the air source blower speed control signals to the air source control connector.

CPR/Emergency Trendelenburg Activated Switch Connector

The CPR/Emergency Trendelenburg activated switch connector provides the interface from the CPR activated switch. The switch is on the base frame, but it is a component of the bed position module (BPM).

Air Source Control Connector

The air source control connector provides the interface from the weigh frame junction P.C. board to the air source blower assembly through the signal distribution connector. The air source blower assembly is on the base frame, but it is a component of the modular therapy system.

Solenoid Actuator Coils

The solenoid actuator coils are electro-mechanical inductive devices that control specific articulated movements of the bed system. The pulse width modulated (PWM) signal opens and closes the solenoid actuator coils on the low side of the solenoid MOSFET drivers. The ESR of the actuator coils is 15 to 17Ω.

Bed Position Module

Basic Description

The Bed Position Module (BPM) consists of position sensors, safety switches, CPR switch, and a weigh frame junction P.C. board. The P.C. board distributes power and the network channel data to all network nodes. It facilitates the signal distribution to the position sensors and safety switches. The P.C. board resides in the articulating deck/weigh frame module with the sensors remotely mounted on the base frame lift arms and articulating deck/weigh frame pivots. The BPM interfaces directly with the power control module (PCM).

Theory of Operation

Weigh Frame Junction P.C. Board

The weigh frame junction P.C. board distributes power, signal, and the network data to all modules in the upper frame, left and right User Control Modules, Graphical Caregiver Interface (GCI) ® Control module, treatment surface, and SideCom® Communication System modules that have two network connection points to allow for inclusion in the network loop. The network is provided as a stub to the auxiliary network port. The network terminator jumper block provides the means to include the treatment surface and SideCom® Communication System modules in the network.

Power Connector

The power connector accepts power from the power control module on the base frame. Ground is distributed on the P.C. board through an inner layer ground plane. The switches and sensors receive 5V DC, via the switch and sensor connector.

Signal Connector

The signal connector interconnects signals that traverse to the base frame module. Primarily it connects all switch and sensor signals to the power control module. It also provides the network and treatment surface blower control signal connections.

Network Terminator Jumper Block

This network terminator jumper block allows configuration of the network. If a treatment surface module is plugged into the connector, the jumper block positions the treatment surface module in the network loop. If a Treatment Surface Module (TSM) is not plugged into the connector, the jumper block connects the network input and output signals present at the treatment surface connector together. The SideCom® Communication System module in a similar fashion uses an identical jumper block. A signal is distributed serially through the treatment surface and SideCom® Communication System modules to detect their presence. Thus, the Power Control Module detects when the jumper blocks are positioned to include the modules but are not present, which is an improperly terminated network.

Treatment Surface Connector

The Treatment Surface connector provides an interconnect point for power, signal, and the network to all treatment surface modules. The signal portion of the treatment surface connector consists of treatment surface modules that control the air blower residing on the base frame.

SideCom® Communication System Connector

The SideCom® Communication System connector provides an interconnect point for power, signal, and the network to the SideCom® Communication System module. The audio channels and the volume control signals travel to the siderails and to the auxiliary port for future considerations.

Left and Right Intermediate Siderail Connectors

Left and right intermediate siderail connectors are interconnect points for power, signal, and network control signals that are needed for intermediate siderail controls. The signals consist of the head siderail hilow switch and the volume control. Two network connections keep the right intermediate siderail and the Graphical Caregiver Interface (GCI)® Control in the network loop. A network connection keeps the left intermediate siderail in the network loop, and it contains the network termination resistor.

Left and Right Head Siderail Connector

Left and right head siderail connectors provide interconnect points for the hilow switches and speakers in the head siderails. The hilow switch inputs connect to the intermediate siderail node while the speaker connects directly to the SideCom® Communication System connector.

Auxiliary Network Connector

The auxiliary network connector provides power, signal, and the network to remote modules that include the patient control pendant, interactive television pendant, and diagnostic tools. The signals consist of the SideCom® Communication System module's speaker right and volume control channels.

Switch and Sensor Connector

The switch and sensor connector provides power for the safety switches and bed position sensors located in the base frame. Signals from safety switches and bed position sensors return to the connector.

Head, Knee, Foot Articulating and Foot Retract Linear Sensors

The head, knee, foot articulating, and foot retract linear sensors sense the positions of the articulating deck for the head, knee, and foot sections.

Bed and Foot Hilow Linear Sensors

The bed and foot hilow linear sensors sense the height and angles of the intermediate frame for the bed and foot sections.

Remove Ft Board Detection Switch

The remove footboard detection switch detects the presence/absence of the footboard on the bed.

CPR Activated Switch

The CPR activated switch detects the activation of the CPR pedal.

Emergency Trendelenburg Switch

The Emergency Trendelenburg switch detects the articulation of the Emergency Trendelenburg pedal.

Brake Not Set Switch

This Brake not set switch detects the state of the brake.

Scale Module

Basic Description

The Scale Module (SM) provides the patient weighing features. Its main components are the load beam sensors, software, and electronics. The Scale Module measures the voltage from the load beam sensor and generates a voltage proportional to the applied force or load.

The scale module software computes the weight on the bed, and provides weigh, zero, calibration, set weight, and patient exit detection functions that are initiated via network commands. The scale module hardware and P.C. board assembly contain and support the following:

- High resolution A/D converter
- Analog multiplexer for selecting the appropriate beam signal
- Regulated power supply
- Serial EEPROM for nonvolatile memory
- Echelon 3150 microcontroller that supports circuitry, such as EEPROM, reset, and oscillator

Load Beams

The load cells in the scale system generate a 2.6 mv signal for 400 lb (180 kg) of applied load. The bridge excitation or supply voltage adjusts the magnitude of the response. This magnitude value is multiplied by 2.6 mv. For example, if the bridge excitation voltage is 10V, the voltage will be 26 mv at 400 lb (180 kg). If the reading from a load cell with a 10V DC excitation voltage is 10 mv, then the applied weight is (400/26 mv) x 10 mv = 153.85 lb (69.28 kg).

These sensors have a linear response, which simplifies calibration and predicting their behavior. There are four load beams. Each is located near the corner of the bed. They are identified by bed corner locations: right head, left head, left foot, and right foot, which are referenced by a patient’s position when laying on their back. The scale electronics scan the signals from all four beams, and divides each beam signal by a scaling factor to convert from voltage, or A/D counts, to weight. The software then combines the four weight or beam readings and sends this value to the network.

Calibration

Before the scale is used, it must be calibrated. The system is calibrated by placing a known weight on the bed at four positions and recording beam readings which are used to generate a matrix. It is important that the scale is calibrated with the bed as a system, so scale electronics, frame effects, and beam variations are calibrated out of the system. The calibration weight represents the maximum load the beam will see in normal operation. Before a calibration, the bed is zeroed, and then the calibration weight is moved to four corners of the bed, readings are recorded, and a matrix is generated. At the end of the calibration, the matrix is solved for the calibration coefficients, which are stored in nonvolatile memory.

Theory of Operation

Load Cell

A load cell generates an output that is proportional to the applied weight or force.

Scale Module P.C. Board

The Scale Module P.C. board assembly contains the electronics required to interface between the load cells and the network. The scale module P.C. board provides the bridge excitation voltage for the load cell sensors. The A/D converter converts the sensor output to digital representation. The analog multiplexer selects the load cell to be digitized by the A/D converter. The network microcontroller reads the A/D converter digital output.

Digital Power Supply Regulator

The digital power supply regulator provides a regulated 4.75 to 5.25V DC power supply voltage.

Analog Supply Regulator

The analog power supply regulator provides a regulated 4.75 to 5.25V DC power supply voltage.

Analog Supply Negative Regulator

The analog power supply regulator provides a regulated negative 4.75 to 5.25V DC power supply voltage.

A/D Converter

The A/D converter measures an analog input voltage and provides a digital number, which is proportional to the analog input voltage amplitude. The resolution is 16 bits which provides a range of 0-65535 counts.

Analog Multiplexer

The analog multiplexer selects one of the four load cell signals and inputs to the A/D converter. The network microcontroller selects the control signals to determine the appropriate load cell.

Power Monitor

The power monitor holds the network microcontroller in a reset condition until the regulated power supply is functional.

EEPROM

The serial EEPROM provides nonvolatile memory storage for preservation of data if power is removed.

Network Microcontroller

The network microcontroller executes programmable instructions to control the analog multiplexer, A/D converter, EEPROM, and network communications.

Graphical Caregiver Interface (GCI)® Control

Basic Description

The Graphical Caregiver Interface (GCI)® Control module supports the Trendelenburg, diagnostic patient weight options, and treatment surface accessories. It also supports special bed articulation positions. It utilizes a graphic display along with a software menu structure to provide full caregiver interaction. The Graphical Caregiver Interface (GCI)® Control automatically recognizes what supported features are on the bed and provides the appropriate controls to the user. The Graphical Caregiver Interface (GCI)® Control is located on the intermediate siderails and electrically connects to the network.

Theory of Operation

Graphical Caregiver Interface (GCI)® Control P.C. Board

The Graphical Caregiver Interface (GCI)® Control P.C. board provides a user interface that consists of Liquid Crystal Display (LCD) and input keys. The Graphical Caregiver Interface (GCI)® Control translates user input into bed functions that are furnished to the network via the echelon network controller. The Graphical Caregiver Interface (GCI)® Control P.C. board also provides a real-time clock and nonvolatile memory.

Power Supply Regulator

The power supply regulator provides a regulated 4.75V to 5.25V DC power supply voltage.

Real-Time Clock

The real-time clock provides the current date, time, and nonvolatile RAM. It has its own battery and crystal oscillator that allows it to keep track of the time and date if power is removed from the Graphical Caregiver Interface (GCI)® Control. Also, a nonvolatile RAM variable storage is provided if power is removed from the Graphical Caregiver Interface (GCI)® Control.

Graphic Display

The graphic display, a Liquid Crystal Display (LCD) with an integrated back light, provides pixel resolution of 320 x 240.

Bias Power Supply

The bias power supply provides - 22 to - 24V DC bias voltage for the Liquid Crystal Display (LCD).

LCD Back Light Inverter

The LCD back light inverter is a power supply that provides 600 to 900V AC to light the LCD fluorescent back light. The microprocessor turns the back light off by removing the required 5V DC.

Graphic Display Controller

The Graphic Display Controller (GDC) interfaces between the Liquid Crystal Display (LCD) and the microprocessor, and sends display data to the GDC. The GDC generates all of the signals required by the Liquid Crystal Display (LCD).

Display Contrast Adjust

The display contrast adjustment provides a variable negative voltage to adjust the viewing contrast of the LCD. The user adjusts the viewing contrast voltage from the Graphical Caregiver Interface (GCI)® Control user interface.

Static Random Access Memory (RAM)

The static RAM stores and retrieves data elements for the microprocessor. The amount of static RAM on the Graphical Caregiver Interface (GCI)® Control is 128K x 8.

Flash Electronic Programmable Read Only Memory (FPROM)

Flash programmable read only memory (FPROM) with electrically erasable sectors has a Graphical Caregiver Interface (GCI)® Control flash memory of 512K x 8.

Watchdog Timer/Power Monitor

The watchdog timer/power monitor holds the Graphical Caregiver Interface (GCI)® Control in a reset condition until the regulated power supply is operational. If the microprocessor does not toggle the watchdog input signal every 1.6 s, the microprocessor automatically resets.

Network Controller

The network controller sends information to the network and controls data flow between the microprocessor and the network.

Switches and Switch Interface

Switches and the switch interface from the user input controls to the microprocessor. The state of the switch is monitored by the microprocessor.

Microprocessor

The microprocessor reads and executes instructions from the flash memory. The resources that support the microprocessor are address latches, bus transceivers, RAM, Flash EPROM, Real-Time Clock and NVRAM.

User Control Module (UCM)

Basic Description

The user control module (UCM) provides control switches and indicators that are used by caregivers for patient positioning and lockouts. The UCM module accepts data from the following siderail modules: nurse call, patient lighting and entertainment, patient positioning, enhanced entertainment, patient exit and detection, and mattress modules. The UCM, an echelon-based node, uses RS-485 interface to communicate to other nodes on the TotalCare® Bed System. The UCM provides the RS-485 network connection for the Graphical Caregiver Interface (GCI)® Control. The user control modules reside in the intermediate siderails and connect to the network.

The following caregiver controls are on the caregiver control siderail panels: **Head Up/Down** arrows, **Knee Up/Down** arrows, **Foot Up/Down** arrows, Foot adjust extend/retract arrows, chair symbol, Trendelenburg/Reverse

Trendelenburg symbols, flat symbol, Enable key symbol, Lockouts—Knee, Head, Hi-Lo, and Master. The Bed up/down controls are on the outside of the head siderail.

The following indicators are on the caregiver control siderail panels: Brake not set, Chair position, Remove ft board, Unplugged, battery condition Charged/Low, Bed exit, Service required, Enable key, and Lockouts—Knee, Head, Hi-Lo, and Master.

Basic Architecture

Nurse Call Control Assembly

The nurse call control assembly provides three nurse call switches on each siderail. Two switches are on the patient side of the rail. One is primarily used when the bed is in the bed configuration, and the other switch when the bed is configured in the chair position. The third nurse call switch on the caregiver side of the rail is used primarily by the caregiver. Each nurse call switch is back lighted when the SideCom® Communication System module is present. Each nurse call switch has an Nurse answer indicator that blinks when a nurse call signal has been placed. Once the call has been answered, the light remains on indicating an open microphone.

The nurse call assembly also includes a speaker.

Patient Articulation Assembly

The patient articulation assembly provides the patient with four switches on the intermediate siderail. These switches provide the patient with the following arrow functions: **Head Up, Head Down, Knee Up**, and **Knee Down.** The **Head Up/down** switches are back lighted. The back lighting indication comes on when the bed is plugged into an AC power outlet.

Patient Entertainment Assembly

The patient entertainment assembly provides the patient with four switches on the intermediate siderail. The entertainment switches provide the patient with the following functions: Room light, Read light, Music, TV up/TV down. The room and read light switches are back lighted. The back lighting comes on when the bed is plugged into AC power outlet. There is a volume control included with this module.

Enhanced Entertainment Assembly

The enhanced entertainment assembly provides the patient with two additional switches used for enhanced entertainment features. This module is used on both left and right siderails.

Patient Exit Detection Assembly

The Patient Exit Detection (PED) assembly provides the caregiver with the controls to configure the Patient Exit Detection system. It provides the following switches: Bed exit on/off, Alarm on/off, Bed exit delay change and provides the following indications: Bed exit on/off, Alarm on/off, 0 seconds, 2 seconds, 4 seconds, and 6 seconds. This assembly is on the caregiver side of the intermediate siderail in the Graphical Caregiver Interface (GCI)® Control position. It may be used on either side of the bed.

Treatment User Control Assembly

The treatment user control assembly provides the caregiver with the controls to use the treatment surface option. It provides the caregiver with the following controls: **Max-Inflate** with indicator, **Normal** with indicator, **Alarm Silence** with indicator, and a **Heel suspension** indicator (only).

Bed Up/Down Assembly

The **Bed Up/down** assembly on the head siderail contains two switches: **Bed up** and **Bed down.** The assembly connects to the weigh frame junction P.C. board.

Theory of Operation

Power Supply Circuit

The power supply circuit regulates the VBATT voltage supplied by the power control module (PCM), to provide the 5V digital voltage used by the User Control Module (UCM). VBATT voltage keeps the siderail controls active when AC power is removed, and the battery option is present.

PTC Circuit

The PTC provides protection to limit the current drawn by the User Control Module to 500 ma.

Low Voltage Monitor

The low voltage monitor circuit monitors the 5V supply voltage and holds the echelon in reset when the power supply voltage falls below a safe operating level.

RS-485 Transceiver

The RS-485 transceiver utilizes the RS-485 protocol and operates at 78.5 kHz. This circuit contains transzorbs to help protect against Electrical Static Discharges (ESD) events.

Row Selection Logic

Due to the limited I/O lines on the echelon, row selection logic adds 16 rows of additional circuitry. The User Control Module has the capability to read up to 58 different switches.

Caregiver/Patient Control Switch Matrix

The caregiver/patient control switch matrix contains up to 58 switches that are located on the User Control Module or subassemblies. Two switches pressed at the same time are always valid. If three or more switches are pressed at the same time, the User Control Module does not propagate any switch closures. Exceptions are pressing of the **Enable key** and any nurse call switches that close no matter how many other switches have been pressed. Certain combinations of switches used for calibration and diagnostics are also valid. These switch combinations are limited to rows of switches located on the caregiver controls.

LED Display Driver

The echelon microcontroller communicates to LED display drivers via an SPI interface. These display drivers control up to 66 different LED indicators. The indicators are located on the User Control Module P.C. board or any of the sub-modules. The brightness of the LED indicators may be varied by hardware changes of replacing a single resistor or by software changes that only provide a limited control of LED brightness.

Echelon 10 MHZ Circuit

The User Control Module uses an Echelon microcontroller to run the application code and provide communications within the network. When the voltage hits 4.75V, the 5V supply voltage resets using the power-on reset and low voltage detecting circuits to place the Echelon microcontroller in the reset mode. The application code for the node stores into a one-time, 32K x 8 programmable Read Only Memory.

Speaker

The speaker provides nurse call and entertainment audio to the bed from the Nurse call system. It is also used as a microphone to allow the patient to speak to a caregiver over the nurse call system.

Volume Control

The volume control on the patient entertainment User Control Module controls the volume level to each speaker. The volume control does not turn off the nurse call audio to the bed.

Column Verification Circuitry

The column verification circuit provides the User Control Module the ability to toggle the I/O lines 4 through 7 and to ensure that the neuron reads the closure of the switches.

ESD Protection

The Electrical Static Discharge (ESD) protection circuits protect the row selection logic outputs and the column inputs from ESD events. These output/input lines have an increased chance of an ESD event because the components are located on the siderails and connected by cable assemblies.

Row Verification Circuit

The row verification circuit verifies that the proper row has been selected. It confirms that the hardware is performing the operation that the software is requesting. If a fault is detected, no switch closures occur.

Bed Exit Alarm

The patient exit detection module consists of a sensor(s) on the intermediate frame that detects the presence of the patient in the bed. It connects to the SideCom® Communication System module and to the facility information system interface P.C. board, or to the network node through the junction P.C. board. Upon receiving a Patient Exit Detection signal, the SideCom® Communication System module signals the nurse call (remote alarm state), and initiates audible and visual alarms (local alarm state).

When the patient gets out of bed with the bed exit alarm turned on, the bed system sounds a continuous audible alarm, and the User Control Module blinks the Bed exit ON indicator for 1.0 ± 0.050 s every 2.0 ± 0.2 s.

NOTE:
The caregiver may adjust the Patient Exit Detection alarm delay from 0 to 6 s in 2 second increments by pressing a Patient Exit Detection feature control. The local and/or remote Patient Exit Detection alarm activates within ± 1 second of the selected delay setting.

- The Patient Exit Detection module or Graphical Caregiver Interface (GCI)® Control module sends a periodic audible alarm condition to the Power Control Module via the network and a visual alarm condition to the network to alert the caregiver when the bed system is outside the range of permissible Patient Exit Detection positions.
- The SideCom® Communication System module communicates a Patient Exit Detection alarm condition input from the network to the central nursing station.
- The Graphical Caregiver Interface (GCI)® Control provides a visual alarm when a Patient Exit Detection alarm condition is received from the network.
- The Graphical Caregiver Interface (GCI)® Control displays an alarm message regarding system malfunctions.
- The User Control Module and SideCom® Communication System module output a nurse call alarm signal to the facility information system network after the control is pressed as part of the nurse call control option.

SideCom® Communication System Module

Basic Description

This module supports the TotalCare® Bed System echelon network image for all module input software variables.

The SideCom® Communication System module provides the gateway between the network and the standard 37-pin, sub-miniature, SideCom® Communication System interface. It connects to the network node and the User Control Module, and resides in the intermediate frame.

The SideCom® Communication System module consists of the interface connectors and P.C. boards. With the bed system in any position, the auxiliary network port located on the SideCom® Communication System module at the head end of the intermediate frame is easily accessible.

Theory of Operation

Patient Lighting/Entertainment

When the bed system is equipped with the patient lighting/entertainment control option, after the patient presses an entertainment/lighting switch, control signals with entertainment/lighting data are sent to the facility information system interface. The SideCom® Communication System module outputs the lighting/entertainment control signal to the facility information system interface within 500 ms.

Nurse Call

When the bed system is equipped with the nurse call option, after pressing a nurse call switch, the User Control Module and SideCom® Communication System module output a nurse call alarm signal to the facility information system network within 500 ms.

The SideCom® Communication System module provides direct connections between the facility audio channels and the User Control Module speakers and volume control via the Bed Position Module.

Patient Exit Detection

When the bed system is equipped with the Patient Exit Detection option, SideCom® Communication System module with remote Patient Exit Detection is available. The SideCom® Communication System module communicates a Patient Exit Detection alarm condition input from the network to the central nursing station. The local and/or remote Patient Exit Detection alarm activates within ± 1 s of the selected delay setting.

The Patient Exit Detection module consists of a sensor(s) on the intermediate frame that detects the presence of the patient in the bed. The sensed exit data is fed to the SideCom® Communication System module and to the facility information system interface P.C. board, or fed to the network node through the weigh frame junction P.C. board. Upon receiving a Patient Exit Detection signal, the SideCom® Communication System module signals the nurse call (remote alarm state), and initiates audible and visual alarms (local alarm state).

When the Patient Exit Detection is armed, a communication failure between the Patient Exit Detection feature and the SideCom® Communication System module automatically places a nurse call signal to the facility information system.

Periodic Alarm

If the bed exit system is armed, the bed system sounds the periodic audible alarm when periodic communications between the power control module, scale module, and SideCom® Communication System module fail.

Interactive Television Control Pendant

The interactive television control pendant module connects to either the auxiliary network port or the weigh frame junction P.C. board.

Air System

Basic Description

The air system consists of components and enclosures required to generate and distribute pressurized air to the control modules. The system consists of a blower housed in the base, air plumbing, control modules, and an air manifold. The blower supplies pressurized air and a vacuum, which are piped through the air plumbing to the air manifold. The air manifold distributes the air to the control modules, which are housed in the manifold. The control modules contain the valves necessary to maintain the proper air pressure in the bladders.

Blower Description

The blower is housed inside of a blower box on the base, which is designed to reduce noise and allow intake air to be filtered. The blower provides pressure and vacuum to the air manifold. The blower is an AMETEK multifunction brushless DC blower with an internal control board. The blower board converts 115V AC signal, and a 0-12V DC incoming signal into a speed control signal. The internal control board is responsible for driving the blower. The blower pressure level is monitored through a pressure tap in the air manifold. The blower pressure is maintained at the proper level by an algorithm (mathematical formula) based upon the output of the manifold pressure sensor measured in the Treatment Foot Surface Control Module (TFSCM) and the desired pressure. The blower speed is increased or decreased in response to the comparison of these two electrical signals. The blower is equipped with a thermal shutoff circuit. If the temperature exceeds the limit, the thermal shutoff circuit removes power from the blower.

Air Plumbing Description

The air plumbing consists of two 1.25" (3.18 cm) ID hoses running from the blower to the air manifold. The hoses run inside the base of the bed until reaching the foot end lift arms. The line delivering pressure to the manifold is routed up the foot end lift arm on the patient's left side. The vacuum line is routed up the foot end lift arm on the patient's right side. Both hoses contain a section of retractable hose to pass across the shearless pivot area of the bed. The hoses terminate at the inlets to the air manifold.

Air Manifold

The air manifold receives supply air from the air plumbing and acts as an accumulator and distribution point for the pressure and vacuum. The manifold contains seven supply ports for pressure and seven supply ports for vacuum. Five sets of ports are dedicated to the removable control modules and have shutoff valves to prevent leakage if the removable control modules are not present. The other two sets of ports are for the TFSCM and the Treatment Surface Control Module (TSCM).

The manifold also acts as the base support for all of the control modules. Each control module can be inserted into only one specific position in the manifold. When the control module is properly inserted, the manifold supply ports provide pressure and vacuum to the module and also provide a manifold bulkhead. The manifold bulkhead allows the control modules to be properly connected to the sleep surfaces.

The air manifold also has a pressure and vacuum tap located near the TFSCM. These taps allow the TFSCM to monitor and control the pressure being supplied to the manifold.

Control Modules

The control modules consist of components and enclosures required to direct and control the airflow from the air source to the patient surfaces as required for specified functions. Control modules dock to the air manifold and articulating deck/weigh frame. The Treatment Foot Surface Control Module (TFSCM) regulates the air pressure in the foot section air cushion modules. And, the Treatment Surface Control Module (TSCM) regulates the air pressure in the head and thigh section of the air cushion modules.

The control modules consist of a set of valves, actuators, pressure transducers, and electronic P.C. boards. They are responsible for maintaining the proper air pressure in the sleep surface zones. Each zone can be controlled to an independent amount of pressure. The control modules are designed to control a specific number of zones. The TFSCM and the TSCM both control three zones.

The control module works by receiving pressure and vacuum supply from the air manifold and using this as the supply for a set of valves. Each zone has a linear actuator positioned between a pressure and vacuum valve. If that zone requires pressure to be increased, the actuator moves to the pressure valve and activates it. If vacuum is needed, the actuator moves to the vacuum valve and activates it. Once the proper pressure is achieved, the actuator moves to a position of not activating either valve.

The valves are directly plumbed to the sleep surface zone and also to a pressure transducer in the control module. The pressure transducer senses the pressure in the sleep surface zone. Through the use of a complex algorithm, the electronic P.C. board converts this pressure into a new set position for the linear actuator. While the bed is on, the pressure is continually controlled to a specific level.

Sleep Surfaces

Basic Description

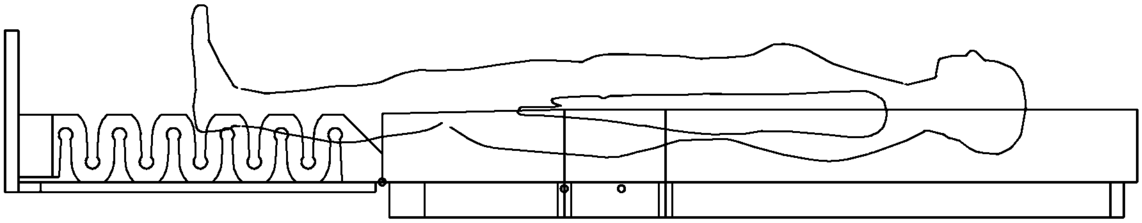
The sleep surface products consist of the primary surface that supports the patient from the head to the knee, and the foot surface that supports the patient from the knee to the foot. Both the primary and foot surfaces are enclosed in a zippered one-piece ticking and rest upon the articulating deck/weigh frame.

The two sleep surface products include the short stay surface and the treatment surface.

Foot Surface

The short stay surface contains an all-foam foot section (see figure 3-48 on page 3-60).

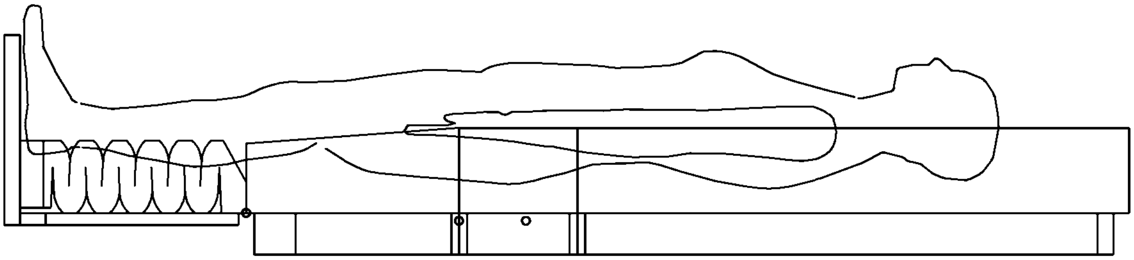
Figure 3-48. Foam Foot Surface (Fully Extended)



m112e190

Retraction of the foot surface is achieved through both compression and closure of the air channels in its construction (see figure 3-49 on page 3-60). The foam foot section does not collapse in the direction perpendicular to the deck.

Figure 3-49. Foam Foot Surface (Retracted)

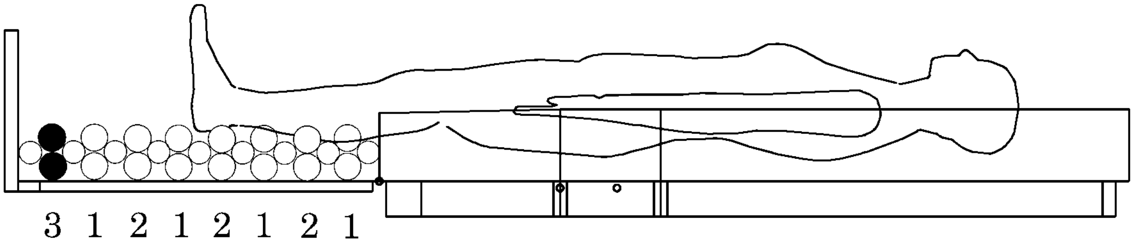


m112e380

The treatment surface contains an air foot surface (see figure 3-50 on page 3-61). The following three zones create the air foot surface:

- Zone 1—Retracting zone
- Zone 2—Collapsing zone
- Zone 3—Heel relief zone

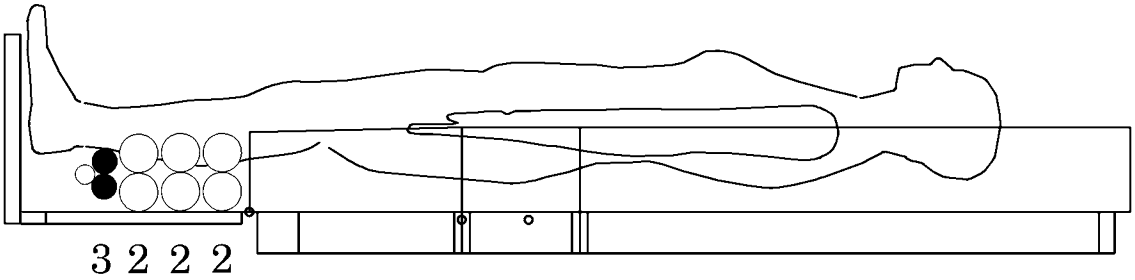
Figure 3-50. Air Foot Surface (Fully Extended, All Zones Inflated)



m112e200

Retraction of the foot surface is achieved by deflating zone 1 (see figure 3-50 on page 3-61). Heel management can then be achieved by slightly inflating zone 2 and deflating zone 3, which is adjacent to the footboard.

Figure 3-51. Air Foot Surface (Heel Relief Retracted, Zone 1 Deflated)



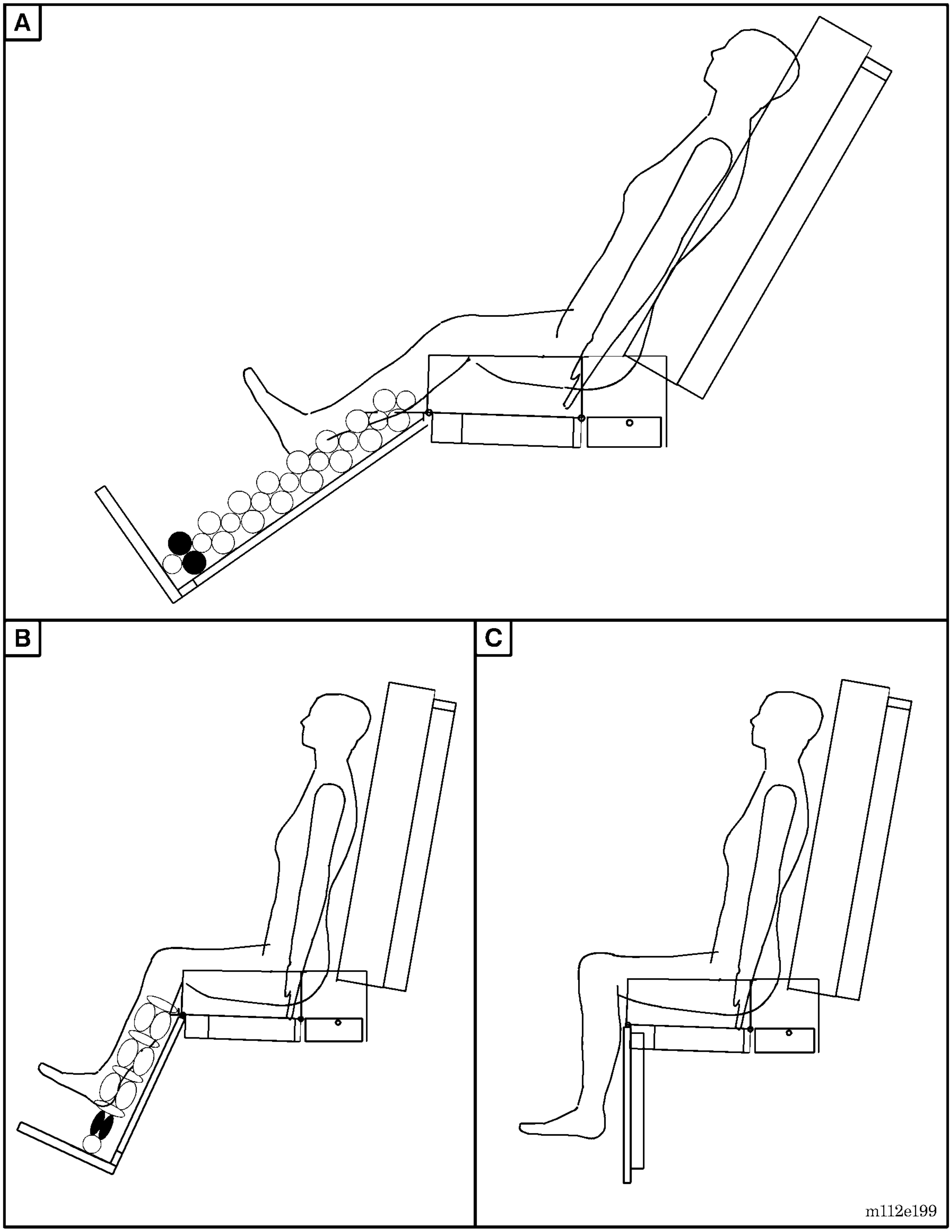
m112e381

For chair positions, all three zones are deflated varying amounts to achieve both retraction and collapse (see figure 3-52 on page 3-62):

- For the Chair position, Zone 1 begins retraction, and Zone 2 begins collapse (see view A).
- For the Recliner position, Zone 1 is partially retracted, Zone 2 is partially collapsed, and Zone 3 is completely deflated (see view B).
- For the Chair Egress position, Zone 1 is fully retracted, and Zone 2 is fully collapsed (see view C).

NOTE:
For the unit to achieve the Chair Egress position, the footboard must be removed.

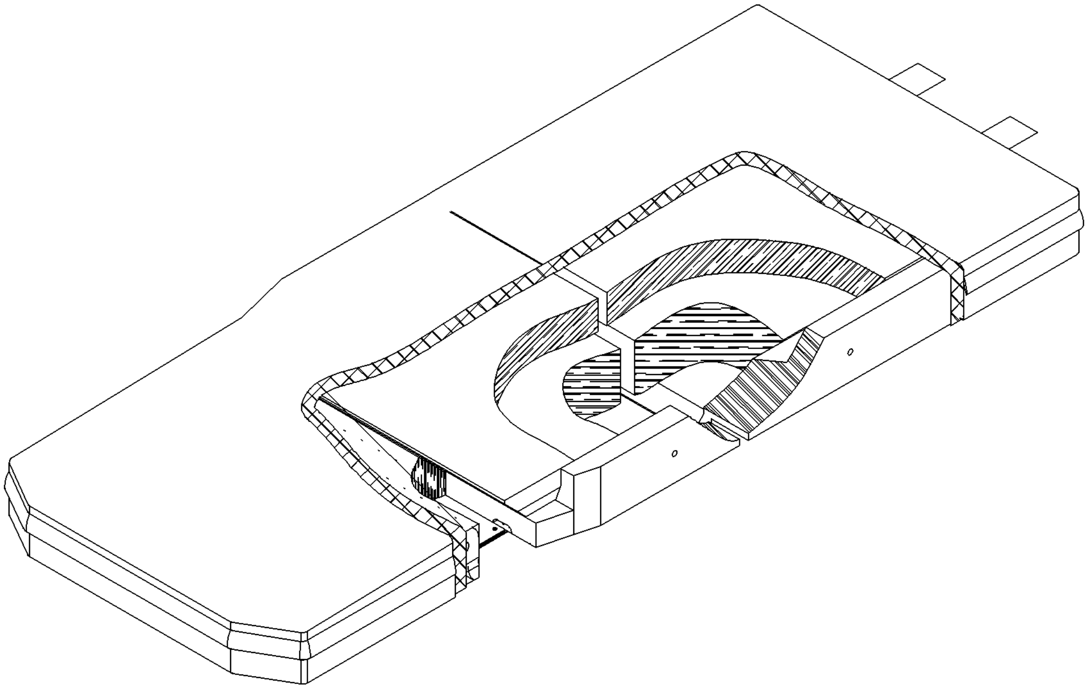
Figure 3-52. Air Foot Surface Functional Chair Operation



Primary Surface

The short stay surface contains a layered, all-foam, primary surface (see figure 3-53 on page 3-63). This surface provides limited pressure distribution characteristics and also does not adjust to changes in frame articulation angles.

Figure 3-53. Short Stay Surface



m112a193

The treatment surface contains an air-cushion-over-foam primary surface (see figure 3-54 on page 3-64). This surface provides optimum pressure distribution characteristics and adjusts to changes in head articulation angles. Optimum pressure distribution is maintained by increasing bladder pressure in the seat and thigh zones, and decreasing bladder pressure in the head zone with increases in head articulation.

Figure 3-54. Treatment Surface

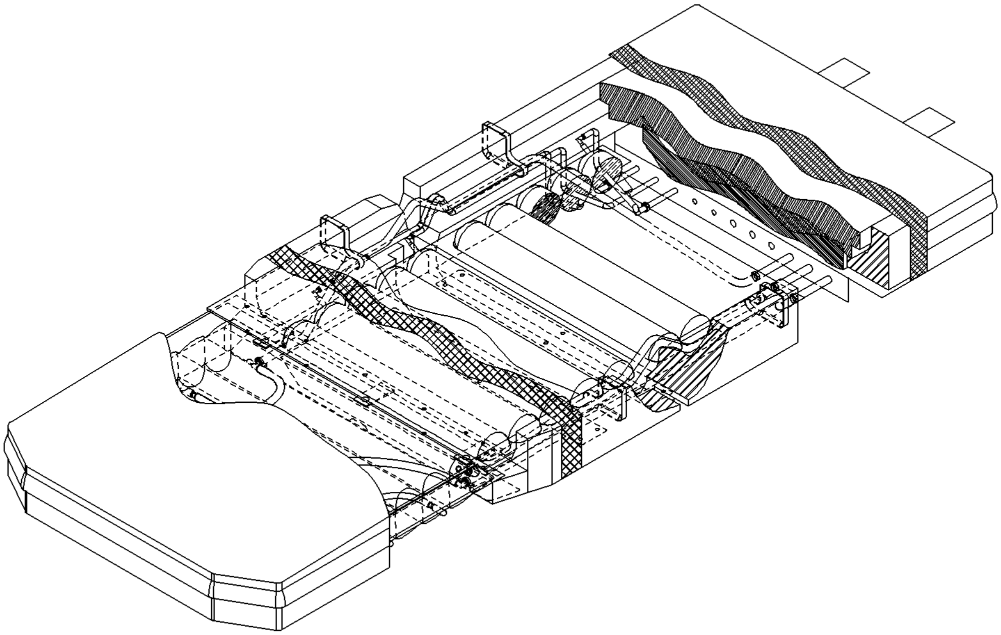
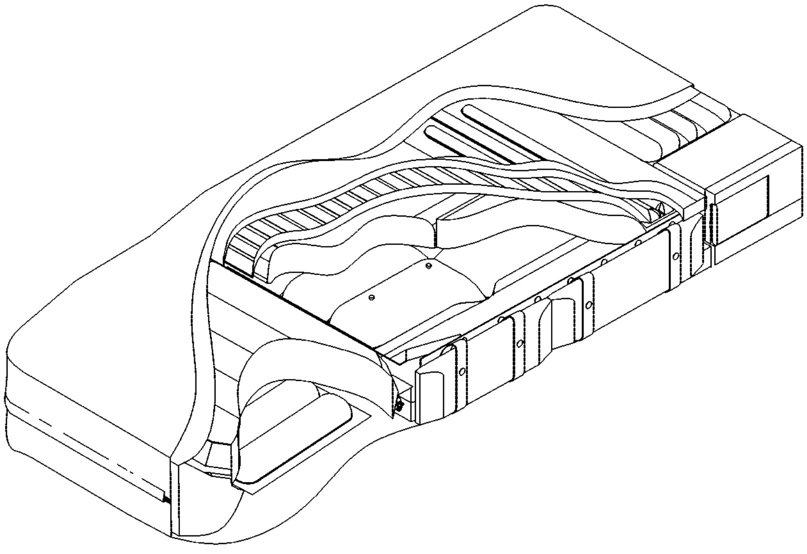


Figure 3-55. Pulmonary Surface



IntelliDrive® Transport System

The IntelliDrive® Transport System is a battery powered, motor driven power assist feature for transporting a TotalCare® Bed System with minimal effort. It consists of special force-sensing push handles, an amplifier/indicator board (PAG) and a power assist box. The power assist box contains: batteries, drive motor, deployment motor for raising and lowering the drive wheel, motor speed controller, a Power Assist Control Module (PACM), drive belt and pulleys.

Push Handles

The push handles incorporate strain gauges to sense the force applied by a caregiver in either a forward or reverse direction. The strain gauges are connected to the PAG board physically located under the TotalCare® Bed System's SideCom® Communication System cover. Each push handle also incorporates an enable switch, at least one of which must be pressed to enable the power assist feature to drive the bed.

Amplifier/Indicator Board (PAG)

The PAG board contains amplifier circuitry to convert the signals from the strain gauges into a throttle signal for the drive motor. The PAG board produces a regulated +12VDC signal from the battery voltage to excite the strain gauges. The strain gauge signals are then combined such that the forces applied to each handle are added together. Pushing with force F1 on one handle and with force F2 on the other handle is equivalent to pushing with force F1 + F2 on a single handle. Likewise, pushing on one handle with force F1 and pulling on the other handle with the same force F1 will effectively be the same as no force. The resultant signal produced by the amplifier circuit is shifted by additional circuitry to provide an output of 2.4-2.6 volts VDC as a neutral level. A net push causes this level to increase, producing a forward throttle signal to the motor controller. A net pull on the handles causes this level to decrease, producing a reverse throttle signal to the motor controller. The full scale forward throttle signal is about 4.0 volts and the full scale reverse throttle signal is about 1.0 volt.

The PAG board also parallels the enable switches in the handles to produce one enable signal to the IntelliDrive® Transport System box.

The last piece of the PAG board is the indicator for the battery gas gauge. Five LEDs indicate the remaining charge in the battery with each successive LED representing approximately 20 percent of the battery capacity.

Power Assist Control Module

The Power Assist Control Module (PACM) consists of a printed circuit board mounted to a heat-sink plate. The plate provides essential heat-sinking for power components of the circuit board and secondarily provides for mounting the assembly inside the IntelliDrive® Transport System box. The PACM supplies the following functions:

- Battery Charger
- Battery gas gauge
- Deployment control
- Enable switch logic & relay
- Drive motor over-temperature protection
- Low-battery shut-off

Battery Charger

The battery charger operates from 23V DC produced at the bridge rectifier of the TotalCare® Bed System whenever the bed is plugged in. It consists of two stages. The first is a DC-DC converter to step the nominal 23V up to 34V DC. The 34V supply powers the second stage, a charger based on the TI/Unitrode®[1] 3906 chip. This charger has three modes of operation: trickle charge, bulk charge and float charge.

Upon application of 23V DC power to the IntelliDrive® Transport System, the charger begins in mode 1, producing a trickle charge current of 20 to 30 milliamps to bring the battery voltage up to 22.5V. In the event a battery has a defective cell, this low level current will not produce a hazardous situation. If the battery is capable of taking a charge, its voltage will eventually come up to 22.5V. (If the battery has been deeply discharged, this may take several days.) Once the voltage is above the trickle threshold, the charger circuit changes to mode 2. In this mode, bulk charging occurs during which current is limited to 750 milliamps. The charger stays in this mode until the battery voltage is approximately 29V to 30V. At this point, the current slowly drops off as the battery nears full charge. When the current drops to 75 milliamps, the charger enters mode 3, the float charge mode. In this mode the charger output will drop to 27.8V to keep the battery topped off. A status output of the 3906 goes high indicating to the gas gauge that charging is complete.

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[1] Unitrode® is a registered trademark of Unitrode Corporation.

There is one adjustment required on the battery charger circuit. With the battery disconnected, and the 23V DC applied, connect a 1 watt, 1.2K Ohm resistor to the battery connector, P10. Adjust R41 until the voltage across P10 is 27.8V ± 0.1V. This sets the float charge voltage.

The 23V DC causes the battery disconnect relay to close, thereby connecting the battery to the charger and to the IntelliDrive® Transport System circuitry. In addition, the 23V DC provides power to raise the drive wheel, if deployed, regardless of the condition of the battery.

Battery Gas Gauge

The battery gas gauge is based on the TI/Benchmarq®[1] 2013H gas gauge chip. The key to the operation of the gas gauge is a 0.005 Ohm resistor between battery minus and IntelliDrive® Transport System ground. The 2013H monitors the voltage across this resistor as a function of time, interpreting positive voltages as current into the battery (charging) and negative voltages as current out of the battery (discharging). The battery capacity is indicated by a five segment LED indicator connected to the PACM. Each LED represents approximately 20% of the nominal battery capacity, i.e., five LEDs lit means there is 80 to 100% capacity in the battery, 4 LEDs lit means 60 to 79%, etc. One LED lit indicates the remaining capacity is less than 20%. When the battery has discharged to about 21.5V, the chip outputs status information which causes the PACM to disconnect the battery in order to prevent deeply discharging the battery.

In the event that discharge occurs such that the battery disconnects or that a battery is replaced, when the AC power is reapplied, the gas gauge chip assumes the battery is empty. The chip will output the above mentioned status information until it senses a charging current and a battery voltage above 22V. Until this level is reached, the chip will not light any LEDs nor will the battery relay stay connected if the AC power is removed.

Deployment Control

There are three operator inputs to the deployment control circuitry: AC power to the bed, the steer switch, and the enable switch. Limit switch inputs, reflecting the deployed and stowed positions of the deployment motor, are the remaining inputs to this circuitry. A state-machine makes up the heart of the deployment control. There are two stable states corresponding to the fully-down and fully-up positions of the drive wheel. Once in the fully-up state, the state machine will remain there as long as the AC power is applied, or the steer switch is open or the enable switch is closed. When the following are all true concurrently: no AC power, steer switch closed, and enable switch open, the logic debounces this condition for more than 100 milliseconds and if still valid, transitions to a state where power is applied to the deployment motor to lower the wheel. At this time a 6.4 second timer is started. The state-machine remains in this state until the deployed limit switch input occurs or the timer expires. The state-machine then transitions to the fully-down state where power is removed from the motor and a signal is output to the motor controller releasing its /INHIBIT input.

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[1] Benchmarq® is a registered trademark of Benchmarq Microelectronics Inc.

Once in the fully-down state, the state-machine will remain there until either AC power is applied or the steer switch is opened. Again, this condition is debounced for more than 100 milliseconds, and if still present, then the state-machine transitions to a state that applies power to the motor to raise the wheel. The 6.4 second timer is started and the /INHIBIT to the motor controller is asserted. The state-machine remains in this state until the stowed limit switch input occurs or the timer expires. The state-machine then transitions to the fully-up state where power to the motor is turned off and the /INHIBIT input of the motor controller is maintained.

Additional logic is incorporated such that if the state-machine is deploying or stowing the drive mechanism and an input occurs that dictates the opposite direction, the new condition is debounced. If still present after 100 milliseconds, the state-machine goes briefly to a neutral state where the motor is turned off and the 6.4 second timer is reset. The state machine then transitions to the state where power is applied to run the motor in the new direction. The timer is restarted at this time as well.

Enable Switch Logic and Relay

The enable switch, when closed, provides an input to the logic which removes the /INHIBIT input to the motor controller. At the same time, a relay is energized which connects the drive motor to the motor controller output. A valid throttle input from the PAG board will cause the motor controller to drive the motor in the desired direction. When the enable switch is subsequently opened, the logic again asserts the /INHIBIT signal to the motor controller, causing it to decelerate the drive motor to a stop. The relay opens after a three second delay, allowing the motor controller time to stop the motor before disconnecting it from the motor controller. As a back-up, the normally closed relay contact shorts the motor producing a further braking effect. This effect will slow or stop the drive motor even if the battery becomes disconnected.

Since a discharged or disconnected battery cannot energize the relay, there needs to be a means to override the braking effect in the event that the wheel is down when the battery fails. A switch connected in series with the motor can be opened by the operator. This will remove the short across the drive motor to allow the motor to be manually driven.

As stated previously, the enable switch must be open along with the steer switch closed and the AC power must be absent to deploy the drive mechanism. A stuck enable switch, one failed closed, will prevent the mechanism from deploying, thus identifying a failed switch.

Drive Motor Over-Temperature Protection

The drive motor has a normally closed thermal switch which opens upon the motor reaching a maximum allowable temperature level. This switch produces an input to the logic that causes the /INHIBIT input to the motor controller to be asserted. The motor controller will bring the drive motor to a stop in this case. In situations where the drive motor is operated under high load (i.e., powering the bed up a ramp) for more than a minute or so, self-resetting fuses (PTCs) interrupt the power connection to the motor controller. As with the thermal switch opening, the motor controller will bring the drive motor to a stop. To manually push the bed in either of these circumstances, the drive wheel can be stowed or the manual override switch can be opened. Upon cooling down of the motor, the thermal switch closes and the PTCs reset. If the override switch is closed, power assist can be resumed.

Low-Battery Shut-Off

The gas gauge chip monitors the battery capacity. When the chip detects the battery at its end of discharge voltage, the logic disconnects the battery to prevent it from deeply discharging.

Drive Motor Brake

The motor relay controlled by the handle enable switch is SPDT, and is configured such that when off, its NC contact shorts the motor and when energized, its NO contact connects the motor to the motor controller to allow the motor to run.

A DC permanent magnet motor acts as a generator when manually driven. The short circuit provided by the NC relay contact makes it difficult for the generator to turn (i.e. the bed becomes difficult to push) and acts as a brake for the bed. This brake gives the bed a controlled coast if the enable switch is released on a ramp or if a low battery disconnects on a ramp.

Because of the shorted motor when the bed has reached the bottom of the ramp, it will be very hard to push. The override switch in the end of the drive box when off, opens the short circuit and allows the bed to be pushed with relative ease. When the override switch is off, it disconnects the motor from the controller and so it must be turned on to restore the drive functions.

NOTE:
The override switch being off does not turn the IntelliDrive® Transport System off, and so the unit will continue to discharge the battery. The circuit breaker is the only means to turn the unit off. The override switch should be left on except when it is desired to manually push the bed when the drive wheel is down.

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Chapter 4
Removal, Replacement, and Adjustment Procedures

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Tool and Supply Requirements

To service the TotalCare® Bed System, the following tools and supplies are required:

- Kit—hilow cylinder brace (P/N SA1695)
- Kit—leak test (P/N SA9076)
- Kit—Torx®[1] bits P/N SA1561, includes (T10 Torx® bit P/N SA4949, T25 Torx® bit P/N SA4950, and T45 Torx® bit P/N SA4951)
- T25 Torx® head screwdriver
- T10 Torx® head screwdriver
- Wheel blocks
- 8" #2 phillips head screwdriver
- 0.073" feeler gauge
- 7/16" deep well socket
- Ratchet
- Ball peen hammer
- ¼" drift punch
- Jack capable of lifting 600 lb (272 kg)
- 4" x 4" x 30" (10 cm x 10 cm x 76 cm) wood jacking brace
- Needle nose pliers
- T15 Torx® head screwdriver
- ¼" nut driver
- Thin applicator knife (optional)
- 9/16" open end wrench
- 9/16" open end torque adapter
- 9/16" deep well socket
- Large basting syringe
- ¼" flexible Tygon®[2] hose
- ½ gal container, clean

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[1] Torx® is a registered trademark of Textron, Inc.
[2] Tygon® is a registered trademark Norton Company.

- Small funnel
- 5/8" open end wrench
- 5/8" deep well socket
- Towels
- ½" open end wrench
- ¼" open end wrench
- AC/DC Volt/Ohms meter
- 3 AG fuse puller
- Calibration weights, 200 lbs (91 kg)
- 4" diagonal cutters
- Torque wrench, 0 in-lb to 25 in-lb (0 N·m to 2.8 N·m)
- Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 17.0 N·m)
- Electrical ground fault detector
- Megameter
- Hydraulic fluid, P/N 31699s
- Loctite®[1] adhesive, 242

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[1] Loctite® is a registered trademark of Loctite Corporation.

4.1 Articulation Position Sensing System Calibration

Tools required: None

Perform the articulation position sensing system calibration whenever components are replaced in the articulation positioning system or the articulation functions do not traverse properly within their designed range.

Calibration Procedure with the Graphical Caregiver Interface (GCI)® Control

To calibrate the TotalCare® Bed System equipped with the optional Graphical Caregiver Interface (GCI)® Control, perform the following:

NOTE:
If bed alarm sounds while calibrating, you must silence the alarm before proceeding.

1. Place the bed in the full up and flat position.
2. Turn the casters perpendicular to the bed at the foot end, so that when the "Foot down" articulation lowers it doesn't hit the casters.
3. Using the Graphical Caregiver Interface (GCI)® Control, select the **Main Menu**.
4. Press and hold the **Up** and **Down** arrow control buttons simultaneously for approximately 20 s. The Graphical Caregiver Interface (GCI)® Control screen displays the **Service Menu**.
5. From the **Service Menu,** select **Calibrate sensors**, and press **ENTER**.
6. Select **Head down**. Press **ENTER**, and hold until the section reaches the mechanical limit.
7. Select **Take reading**. Press **ENTER**.
8. Select **Head up**. Press **ENTER**, and hold until the section reaches the mechanical limit.
9. Select **Take reading**. Press **ENTER.**
10. Select **Knee up**. Press **ENTER**, and hold until the section reaches the mechanical limit.
11. Select **Take reading**. Press **ENTER**.

12. Select **Knee down**. Press **ENTER**, and hold until the section reaches the mechanical limit.

13. Select **Take reading**. Press **ENTER**.

14. Select **Foot Up**. Press **ENTER**, and hold until the section reaches the mechanical limit.

15. Select **Take reading**. Press **ENTER**.

16. Select **Foot down**. Press **ENTER**, and hold until the section reaches the mechanical limit.

17. Select **Take reading**. Press **ENTER**.

18. Return to **Foot up**. Press **ENTER**.

19. Select **Foot Out**. Press **ENTER**, and hold until the section reaches the mechanical limit.

20. Select **Take reading**. Press **ENTER**.

21. Select **Foot in**. Press **ENTER,** and hold until the section reaches the mechanical limit.

22. Select **Take reading**. Press **ENTER**.

23. Select **Hi-Lo down**. Press **ENTER**, and hold until the section reaches the mechanical limit.

24. Select **Take reading**. Press **ENTER**.

25. Select **Hi-Lo up**. Press **ENTER,** and hold until the section reaches the mechanical limit.

26. Select **Take reading**. Press **ENTER**.

27. Select **Save/store settings**. Press **ENTER**.

28. Select **Go to home screen**. Press **ENTER**.

29. Select **Go to main menu**. Press **ENTER**.

30. Stow the Graphical Caregiver Interface (GCI)® Control. This completes the TotalCare® Bed System position sensors calibration.

Calibration Procedure Without the Graphical Caregiver Interface (GCI)® Control

To calibrate the TotalCare® Bed System not equipped with the optional Graphical Caregiver Interface (GCI)® Control, perform the following:

NOTE:
If bed alarm sounds while calibrating, you must silence the alarm before proceeding.

1. Plug the bed into an appropriate power source.
2. Place the bed in the full up and flat position.
3. Turn the casters perpendicular to the bed at the foot end, so that when the "Foot down" articulation lowers it doesn't hit the casters.
4. Press **Enable key**.
5. Simultaneously press the **FullChair, Bed Flat, Trendelenburg, and Reverse Trendelenburg** controls, and hold approximately 15 s until an audible beep sounds.
6. Release the controls. The **Service required** lamp flashes. The bed is now in the calibration mode. If the **Enable key** times out during calibration, repeat the calibration procedure.
7. Press **Head Down**, and hold until the section reaches the mechanical limit.
8. To place the reading into memory, simultaneously press the **Enable key**, **Master Lockout**, and **Head Down** controls.
9. Press **Head Up**, and hold until the section reaches the mechanical limit.
10. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Head Up** controls.
11. Press **Knee Down**, and hold until section reaches the mechanical limit.
12. To place the reading into memory, simultaneously press the **Knee Down, Enable key**, and the **Master lockout** controls.
13. Press **Knee Up,** and hold until the section reaches the mechanical limit.

14. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Knee Up** controls.
15. Return the knee to flat.
16. Press **Foot Up,** and hold until the section reaches the mechanical limit.
17. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Foot Up** controls.
18. Press **Foot Down,** and hold until the section reaches the mechanical limit.
19. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Foot Down** controls.
20. Select **Foot out**, and hold until the section reaches the mechanical limit.
21. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Foot Out** control.
22. Select **Foot In,** and hold until the section reaches the mechanical limit.
23. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Foot In** control.
24. Select **Hi-Lo Up,** and hold until the section reaches the mechanical limit.
25. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Hi-Lo Up** controls.
26. Select **Hi-Lo Down,** and hold until the section reaches the mechanical limit.
27. To place the reading into memory, simultaneously press the **Enable key**, **Master lockout**, and **Hi-Lo Down** controls.
28. To store all calibration data placed into memory, simultaneously press the **Foot In**, **Foot Out**, **Foot Up**, and **Foot Down** panel controls, and hold approximately 15 s until an audible beep sounds.
29. Release the controls. The **Service required** indicator goes out. The TotalCare® Bed System position sensors are now calibrated.

4.2 Patient Weigh System Calibration (Non-NAWI Class IIII Scale Only)

Tools required: 200 lb (91 kg) weight

NOTE:
To calibrate a NAWI Class IIII Scale—European version, refer to procedure 6.6.

Perform the patient weigh system calibration procedure without a patient or any loose articles on the sleep surface.

1. Remove the patient and any loose articles from the sleep surface.
2. Ensure the bed is on a level surface.
3. Ensure that the bed is in the flat position.
4. Apply the foot brake.
5. Remove all equipment from the foot section equipment sockets and secondary drainage bag holders.
6. At the Graphical Caregiver Interface (GCI)® Control **Main Menu**, press and hold the up and down arrow controls simultaneously for approximately 20 s. The **Service Menu** appears.
7. From the **Service Menu,** select **Calibrate scale**, and press **ENTER**.
8. Verify that the following appear on the screen: **Bed is not in trend**, **All side rails are up**, **Foot section is put flat**, and **Head not above 30 degrees**.
9. Select **YES/proceed**.
10. To zero the scale, press **ENTER**.
11. The Graphical Caregiver Interface (GCI)® Control screen flashes **LET GO ZEROing bed.#.**, followed by **SCALE IS ZEROED**.
12. The Graphical Caregiver Interface (GCI)® Control displays the default weight value **203.0 LBS.**
13. Select **ERASE/Change weight**. Press **ENTER**.

14. Using the Graphical Caregiver Interface (GCI)® Control **Up/Down** arrow controls, enter the value of the calibration weight (200.0 lb) into the Graphical Caregiver Interface (GCI)® Control screen by following these steps:
    a. Depress the arrow controls to increment the required value into each integer column.
    b. When one column has the desired value, press **ENTER**.
    c. The cursor moves to the next integer column.
    d. Repeat until the actual value of the applied weight (200.0 lb) is displayed.
15. Place a calibration weight, such as 200 lb (91 kg) on the left foot area.
16. Select **OK/Proceed**. Press **ENTER**.
17. The Graphical Caregiver Interface (GCI)® Control screen flashes **Please wait... 60 sec**. The timer counts down to zero. Two audible beeps indicate the calibration is complete.
18. Place the calibration weight 200 lb (91 kg) on the right foot area.
19. Select **OK/Proceed**. Press **ENTER**.
20. The Graphical Caregiver Interface (GCI)® Control screen flashes **Please wait.... 60 sec**. The timer counts down to zero. Two audible beeps indicate the calibration is complete.
21. Place the calibration weight 200 lb (91 kg) on the left head area.
22. Select **OK/Proceed**. Press **ENTER**.
23. The Graphical Caregiver Interface (GCI)® Control screen flashes **Please wait.... 60 sec**. The timer counts down to zero. Two audible beeps indicate the calibration is complete.
24. Place the calibration weight 200 lb (91 kg) on the right head area.
25. The Graphical Caregiver Interface (GCI)® Control screen flashes **Please wait.... 60 sec**. The timer counts down to zero. Two audible beeps indicate the calibration is complete.
26. The Graphical Caregiver Interface (GCI)® Control screen displays **New coefficient** and the calibration coefficient values. (If the coefficients are in

the range of 3000-4500, the calibration is valid. Values less than 10 indicate an error during the calibration. For error codes, view the **Service required status** screens.)

27. Select **Go to home screen**. Press **ENTER**.
28. Stow the Graphical Caregiver Interface (GCI)® Control module. This completes the TotalCare® Bed System weigh frame calibration.

4.3 Cover—Head End

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench

Removal

⚠ **WARNING:**
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Using the head siderail **Bed Up** control, raise the bed to the maximum height to gain access to the base frame covers.
3. To remove the tub base cover (A), perform the following (see figure 4-1 on page 4-19):
   a. Using a T25 Torx® wrench, remove the mounting screws (E) from the tub base cover (A).
   b. Lift the tub base cover (A) from the base frame.

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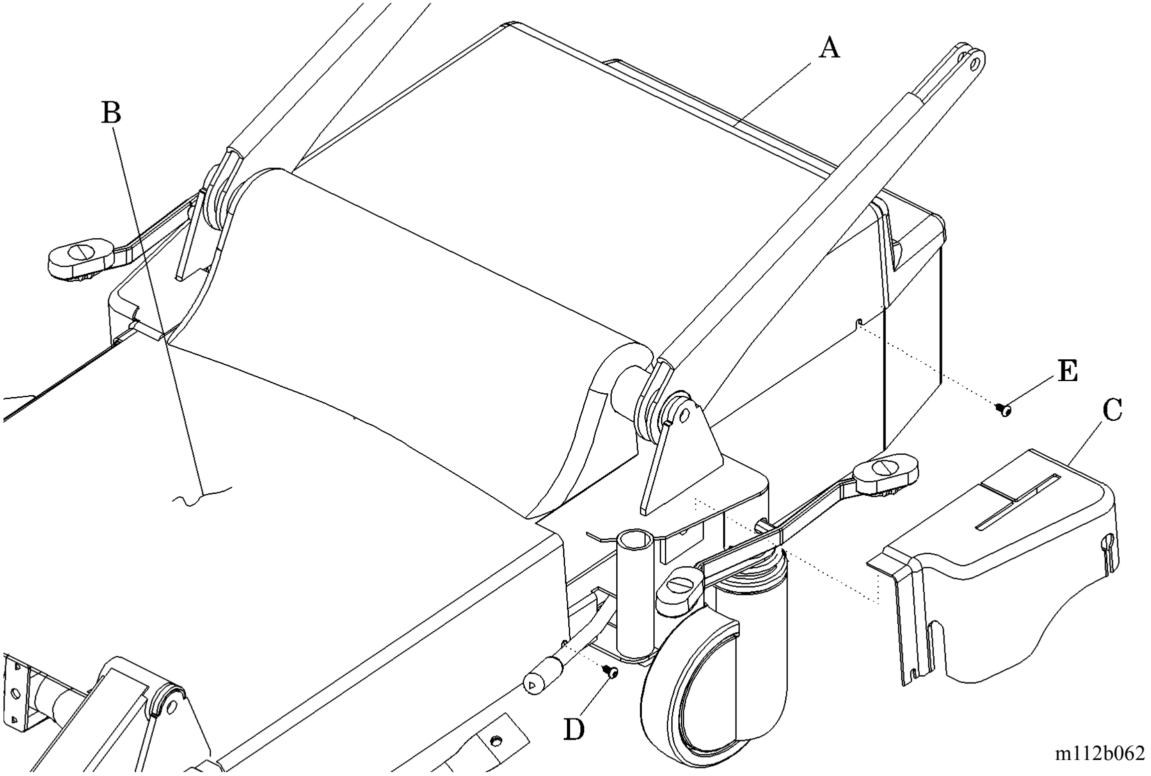
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-1. Head Base Frame and Caster Covers



4. To remove the top center base cover (B), perform the following:
   a. Using a T25 Torx®[1] wrench, remove the mounting screws (D) from the top center base cover (B).
   b. Lift the top center base cover (B) from the base frame.
5. To remove the head end base caster cover (C), perform the following:
   a. Manually spread the cover slit that accommodates the foot actuator, and remove the head end base caster cover (C).
   b. Lift the head end base caster cover (C) from the frame while twisting the cover past the lift arm brace.
6. Install the hilow cylinder brace (refer to procedure 4.4).

Replacement

1. Perform the removal procedure in reverse order.

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[1] Torx® is a registered trademark of Textron, Inc.

2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.4 Hilow Cylinder Brace—SA1695

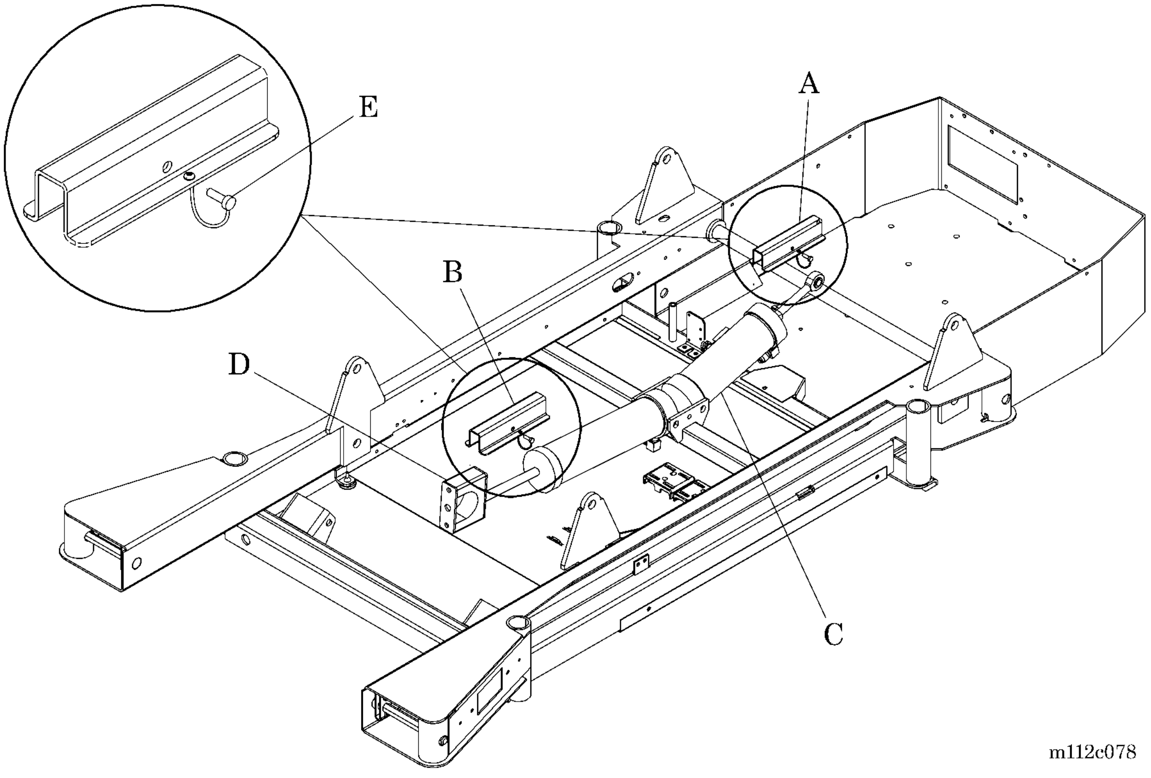
Tools required: T25 Torx®[1] head screwdriver

Installation

NOTE:
There are two styles of cylinder braces. Cylinder brace SA1695 is usable on all models of hilow cylinders. Cylinder brace SA1658 is only usable on hilow cylinders that are black in color.

The hilow cylinder brace includes two brace sections, the hilow head cylinder safety brace (A) and the hilow foot cylinder safety brace (B), for use on the hilow head cylinder (C) and the hilow foot cylinder (D) (see figure 4-2 on page 4-21).

Figure 4-2. Hilow Cylinder Brace—SA1695



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[1] Torx® is a registered trademark of Textron, Inc.

WARNING:
Set the brakes before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Using the head siderail **Bed Up** control, raise the bed to the maximum height to gain access to the base frame covers.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source prior to servicing the hydraulic system.
4. Using a T25 Torx®[1] screwdriver, remove the head end covers to gain access to the hilow head cylinder (C) and the hilow foot cylinder (D).

NOTE:
The short cylinder safety brace is used for the head cylinder, and the long cylinder safety brace is used for the foot cylinder.

5. Install the hilow head cylinder safety brace (A) on the extended push rod of the hilow head cylinder (C).
6. Insert the ball lock pin (E) into the cylinder safety brace (A).
7. Install the hilow foot cylinder safety brace (B) on the extended push rod of the hilow foot cylinder (D).
8. Insert the ball lock pin (E) into the cylinder safety brace (B).
9. Lower the bed onto the cylinder safety braces till there is no weight on the cylinders.

Removal

1. Plug the bed into an appropriate power source.

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[1] Torx® is a registered trademark of Textron, Inc.

2. Using the head siderail **Bed Up** control, raise the bed to the maximum limit.

WARNING:
Do not pry the safety braces out of the cylinders. Weight is still loaded on the safety braces, and the bed could fall, causing personal injury or damage to equipment. The bed must be raised to release the load on the cylinders.

3. Remove the ball lock pins (E) from the cylinder safety braces (A and B).
4. Remove the hilow head cylinder safety brace (A) and the hilow foot cylinder safety brace (B) from the hilow head cylinder (C) and the hilow foot cylinder (D).
5. Using a T25 Torx®[1] screwdriver, install the head end covers (refer to procedure 4.3).

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[1] Torx® is a registered trademark of Textron, Inc.

4.5 Caster Cover—Foot End

Tools required:	Hilow cylinder brace (P/N SA1695) T25 Torx®[1] wrench

Removal

⚠ **WARNING:**
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Using the head siderail **Bed Up** control, raise the bed to the maximum height to gain access to the base frame covers.
3. Remove the head end covers (refer to procedure 4.3).
4. Install the hilow cylinder brace (refer to procedure 4.4).
5. To remove the right foot end base caster cover (A), perform the following (see figure 4-3 on page 4-25):
    a. Using a T25 Torx® wrench, remove the two mounting screws (B) from the right foot end base caster cover (A).
    b. Remove the right foot end base caster cover (A).

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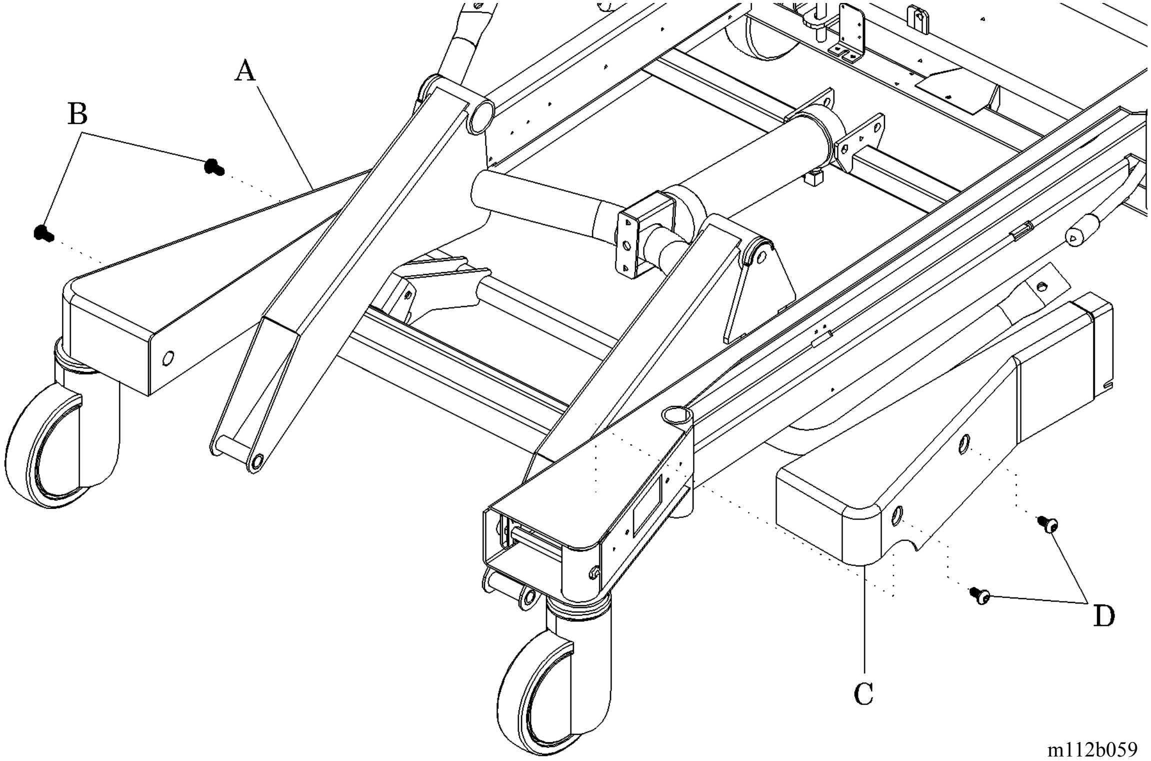
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-3. Foot End Base Caster Cover



6. To remove the left foot end base caster cover (C), perform the following:
   a. Using a T25 Torx®[1] wrench, remove the two mounting screws (D) from the left caster cover (C).
   b. Remove the left caster cover (C).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.6 Foot End Caster Assembly

Tools required:	Hilow cylinder brace (P/N SA1695)
	T25 Torx®[1] wrench
	0.073" feeler gauge
	7/16" deep socket wrench
	Ball peen hammer
	¼" drift punch
	Small screwdriver
	Jack capable of lifting 600 lb (272 kg)
	4" x 4" x 30" (10 cm x 10 cm x 76 cm) wood jacking beam
	Wheel block
	Torque wrench, 50 in-lb to 100 in-lb (5.6 N·m to 11.3 N·m)

Removal

⚠ **WARNING:**
Set the brakes, block the wheels, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Block the wheels.
3. Raise the bed.
4. Install the hilow cylinder brace (refer to procedure 4.4).
5. Place the bed in the Trendelenburg position.
6. Using a T25 Torx® wrench, remove the foot end caster cover for access to the caster hex rod (refer to procedure 4.5).
7. Verify that the brake/steer pedal is in the neutral position.
8. Using a 7/16" deep socket wrench, loosen the connecting clamp (A) that fastens the brake actuating linkage (B) to the caster hex rod (C) (see figure 4-4 on page 4-27).

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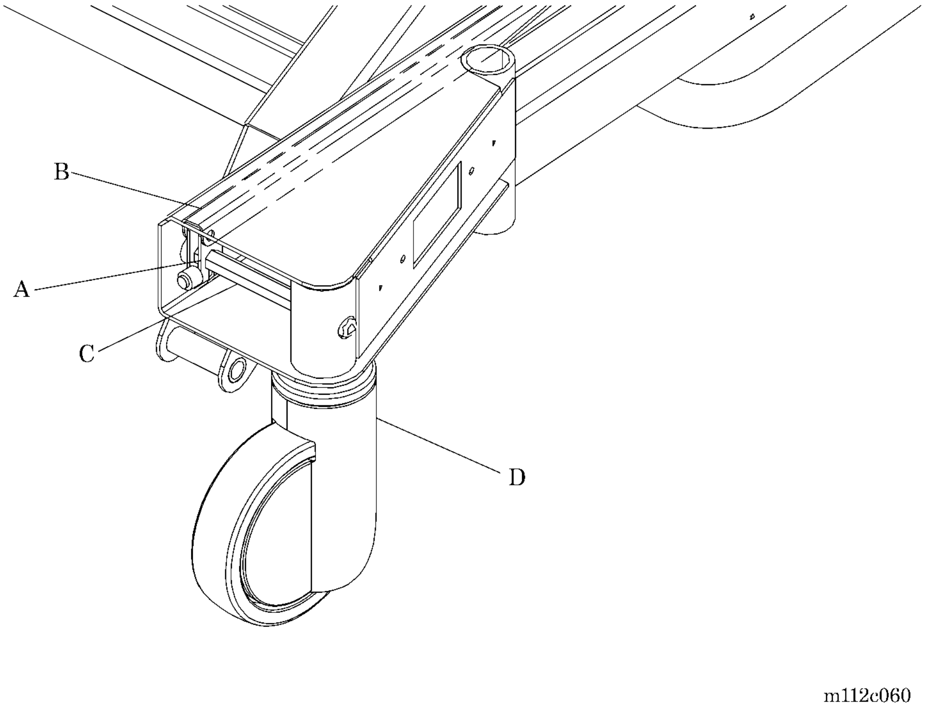
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-4. Foot End Caster Brake Actuating Linkage



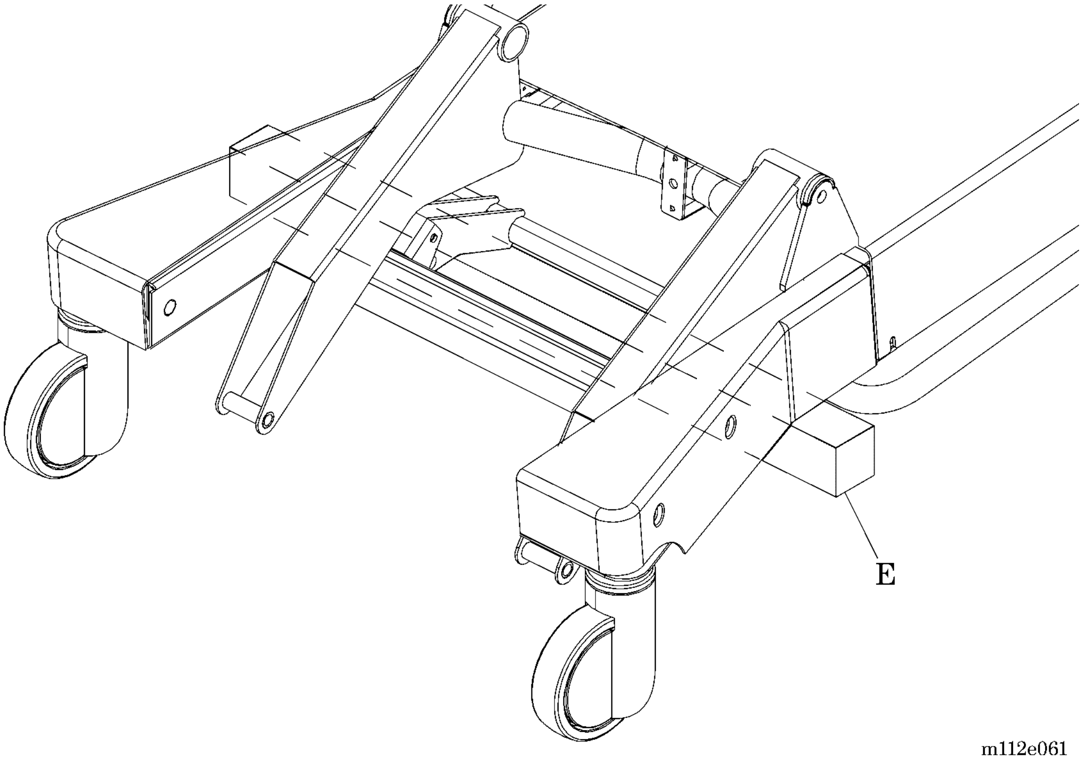
9. Block the wheels at the opposite end of the bed, and return the brake pedal to the neutral position.

WARNING:
The jack must be capable of lifting 600 lb (272 kg) and be in good working condition. Use the jack only on a firm flat surface capable of supporting 600 lb (272 kg). Damage to equipment or personal injury can occur.

CAUTION:
Do not jack or lift the bed by the corners of the frame. The bed must be raised by the end using a crossbeam support capable of lifting 350 lb (159 kg). Damage to equipment can occur.

10. Position the jack in the center of a 4" x 4" x 30" (10 cm x 10 cm x 76 cm) wood jacking beam (E), and raise the caster just clear of the floor (see figure 4-5 on page 4-28).

Figure 4-5. Foot End Base Cover and Jacking Location



11. Slide the caster hex rod (C) from the caster that is being replaced (see figure 4-4 on page 4-27).
12. Using the jack, raise the foot end of the bed approximately 4" (10 cm), or high enough for the caster to drop out of the caster housing (D).

Replacement

NOTE:
Perform all caster adjustments prior to installing the foot end caster cover.

1. Ensure that the replacement caster is the same type as the one removed.
2. Insert the caster hex rod (C) through the caster, and seat it inside the frame.
3. Lower the jack, and remove the wood jacking beam (E) (see figure 4-5 on page 4-28).
4. Attach the brake actuating linkage (B) to the caster hex rod (C) (see figure 4-4 on page 4-27).

5. Using a 7/16" deep socket and torque wrench, torque the connecting clamp (A) to a torque of 60 in-lb (6.8 N·m).

6. Adjust the foot caster. See “Adjustment (P1900A)” on page 4-29.

7. Install the foot end caster cover (refer to procedure 4.5).

8. Remove the wheel blocking.

9. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

Adjustment (P1900A)

1. Ensure that the brake/steer pedal is in the neutral position.

2. Using a ¼" drift punch and a ball peen hammer, gently spin the brake shoe clockwise to tighten, or counterclockwise to loosen.

3. Adjust the gap between the brake shoe and the caster wheel to 0.073" ± 0.023" (1.85 mm ± 0.58 mm).

4. Using the 0.073" feeler gauge, check the gap between the brake shoe and the wheel.

5. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

6. Using a 7/16" deep socket and torque wrench, tighten the connecting clamp (A) to 60 in-lb (6.8 N·m) of torque.

7. Install the foot end caster cover (refer to procedure 4.5).

Adjustment (P1900B, P1900C, and P1900D)

1. Ensure that the brake/steer pedal is in the neutral position.

2. Using a punch or small screwdriver, carefully punch out the plastic cap located on the body of the caster.

3. Turn the screw counterclockwise to decrease tension or clockwise to increase the tension on the wheel.

4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.7 Head End Caster Assembly

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
0.073" feeler gauge
Ball peen hammer
1/4" drift punch
7/16" deep socket wrench
Jack—capable of lifting 600 lb (272 kg)
Small screwdriver
Torque wrench, 50 in-lb to 100 in-lb (5.6 N·m to 11.3 N·m)
Wheel blocking

Removal

WARNING:
Set the brakes, block the wheels, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Block the wheels.
3. raise the bed.
4. Install the hilow cylinder brace (refer to procedure 4.4).
5. Place the bed in the Trendelenburg position as needed to work on the head caster (D) (see figure 4-6 on page 4-31).

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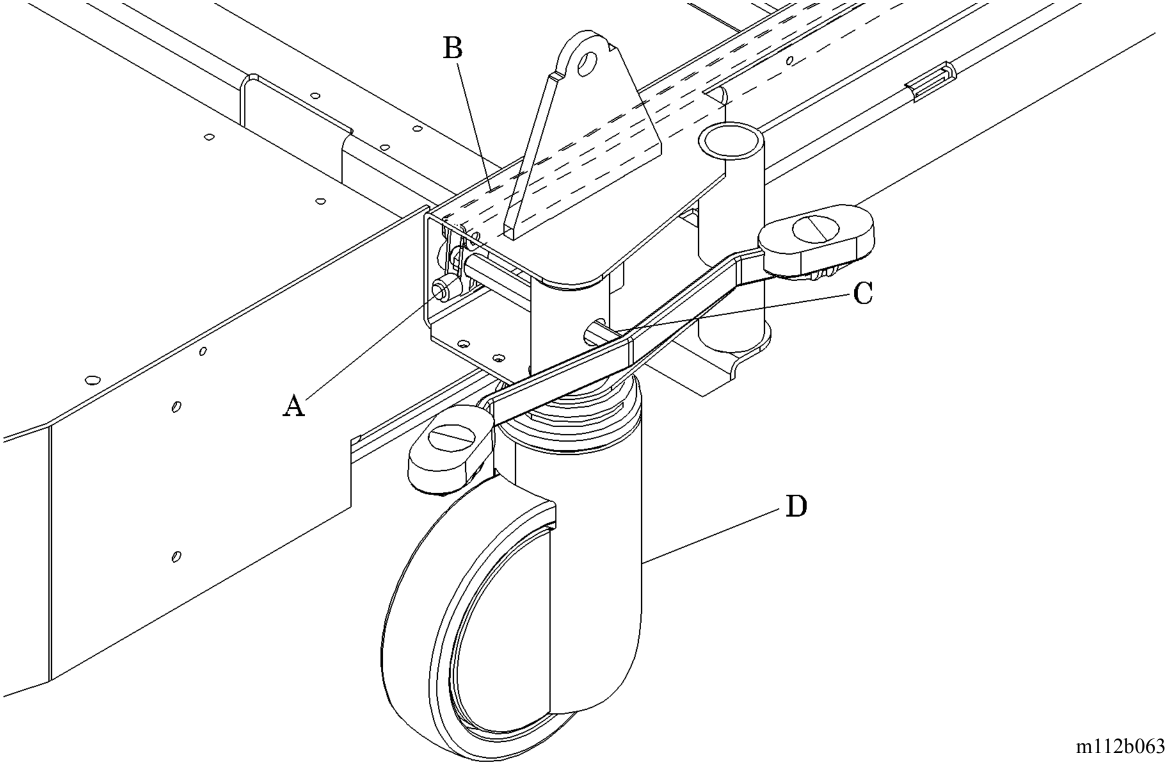
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-6. Head End Brake Actuating Linkage



6. Using a T25 Torx®[1] wrench, remove the head end base and tub base covers for access to the caster hex rod (refer to procedure 4.3).
7. Ensure that the brake/steer pedal (C) is in the neutral position.
8. Using a 7/16" deep socket wrench, loosen the connecting clamp (A) that fastens the brake actuating linkage (B) to the brake/steer pedal (C).

WARNING:
Improper positioning of the jack could cause personal injury.

9. Position the jack in the center of the bottom plate (E) of the base frame at the head end of the frame (see figure 4-7 on page 4-32).

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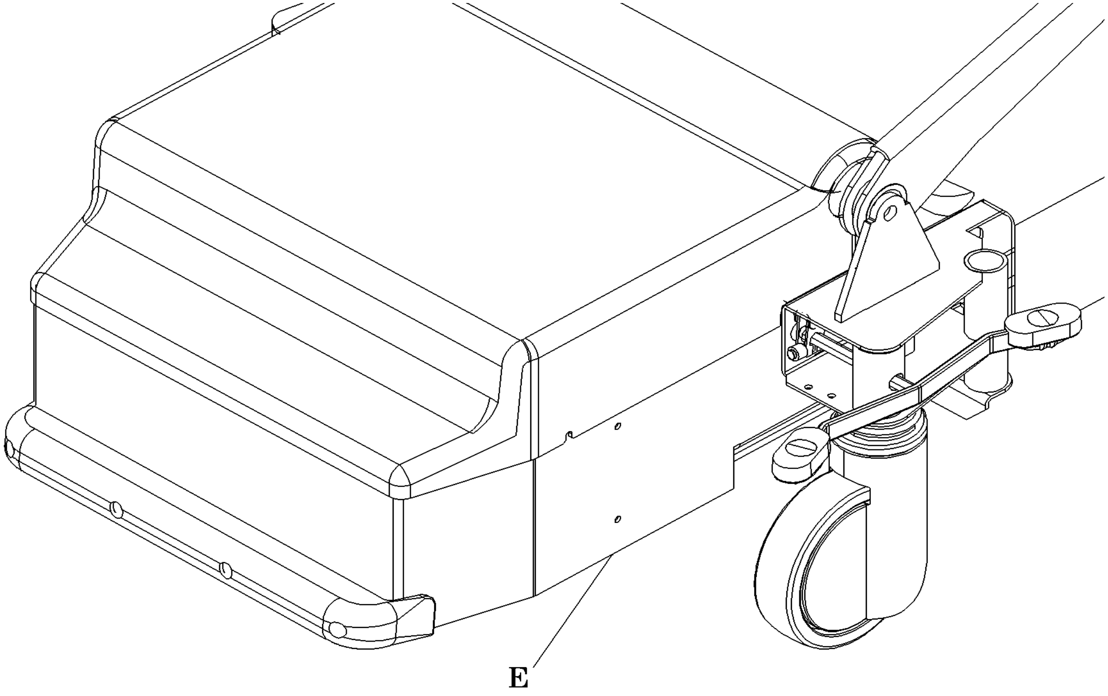
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-7. Jack Position for Changing Head End Casters



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10. Raise the head end until the head caster (D) is just clear of the floor (see figure 4-6 on page 4-31).
11. Slide the brake/steer pedal (C) out of the head caster (D).
12. Using the jack, raise the head end of the base frame high enough for the head caster (D) to drop out of the base frame.

Replacement

1. Ensure that the replacement head caster (D) is the same type as the one removed.
2. Insert the head caster (D) into the base frame.
3. Manually install the brake/steer pedal (C) through the head caster (D), and seat it inside the frame brake/steer hex transfer shaft (torque tube).

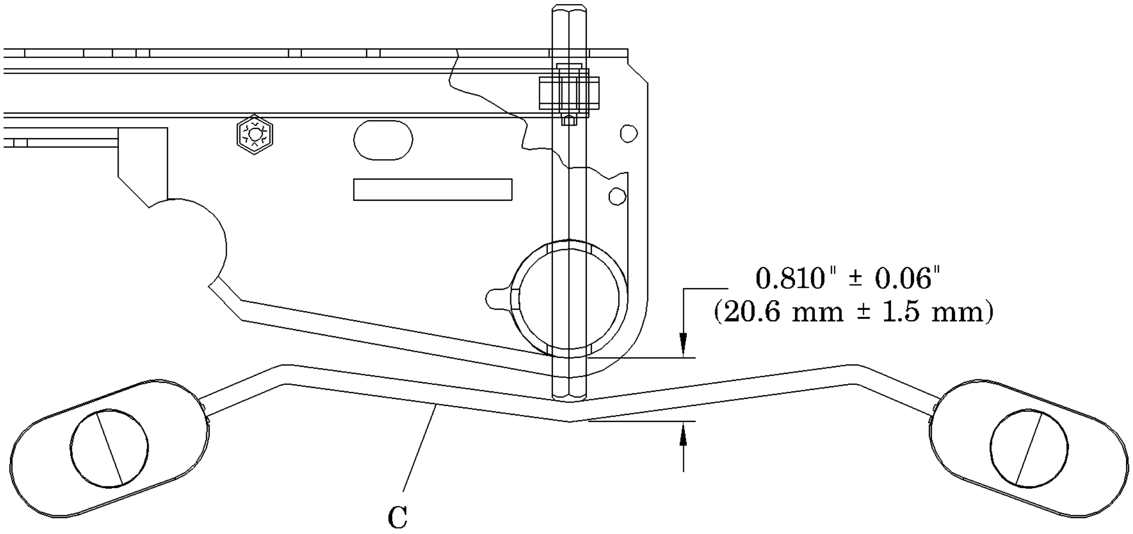
NOTE:
The orange tab on the brake/steer pedal goes toward the foot end of the bed.

4. Using the jack, lower the base frame until the head caster (D) is just above the floor and free to turn.

5. Attach the brake actuating linkage (B) to the brake/steer pedal (C).

6. Ensure that the distance between the base and the brake/steer pedal (C) is 0.81" ± 0.06" (20.6 mm ± 1.5 mm) (see figure 4-8 on page 4-33).

Figure 4-8. Brake/Steer Pedal



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7. Using a 7/16" deep well socket and torque wrench, torque the connecting clamp (A) to a torque of 60 in-lb (6.8 N·m) (see figure 4-6 on page 4-31).

8. If necessary, adjust the head caster (D). See “Adjustment (P1900A)” on page 4-34.

9. Remove the jack, and set the caster brakes.

10. Remove the wheel blocking.

11. Remove the hilow cylinder brace (refer to procedure 4.4).

12. Install the head end base cover, the tub cover, and the head caster covers (refer to procedure 4.3).

13. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

Adjustment (P1900A)

1. Ensure that the brake/steer pedal (C) is in the neutral position.
2. Using a ¼" drift punch and ball peen hammer, gently spin the connecting clamp (A) clockwise to tighten, or counterclockwise to loosen the brake pressure.
3. Adjust the gap between the brake shoe and the wheel to 0.073" ± 0.023" (1.85 mm ± 0.58 mm).
4. Using the 0.073" feeler gauge, check the gap between the brake shoe and the wheel.
5. Using the brake/steer pedal (C), apply the brakes. Verify that the caster is locked.
6. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

Adjustment (P1900B, P1900C, and P1900D)

1. Ensure that the brake/steer pedal is in the neutral position.
2. Using a punch or small screwdriver carefully punch out the plastic cap located on the body of the caster.
3. Turn the screw counterclockwise to decrease tension or clockwise to increase the tension on the wheel.
4. Remove the wheel blocking.
5. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.8 Caster Wheel (P1900A)

Tools required:	Hilow cylinder brace (P/N SA1695)
	T25 Torx®[1] wrench
	8" #2 phillips head screwdriver
	0.073" feeler gauge
	½" socket wrench
	½" open end wrench
	Ball peen hammer
	¼" drift punch
	7/16" deep socket wrench
	Jack capable of lifting 600 lb (272 kg)
	Wheel blocking
	Torque wrench, 50 in-lb to 100 in-lb (5.6 N·m to 11.3 N·m)

Removal

NOTE:
Replace the dual wheel casters in their entirety. Individual wheels are not replaceable.

1. Set the brakes.
2. Block the wheels.
3. Raise the bed.

⚠ **WARNING:**
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

4. Install the hilow cylinder brace (refer to procedure 4.4).
5. Place the bed in the Trendelenburg position to service the caster wheel (A) (see figure 4-9 on page 4-36).

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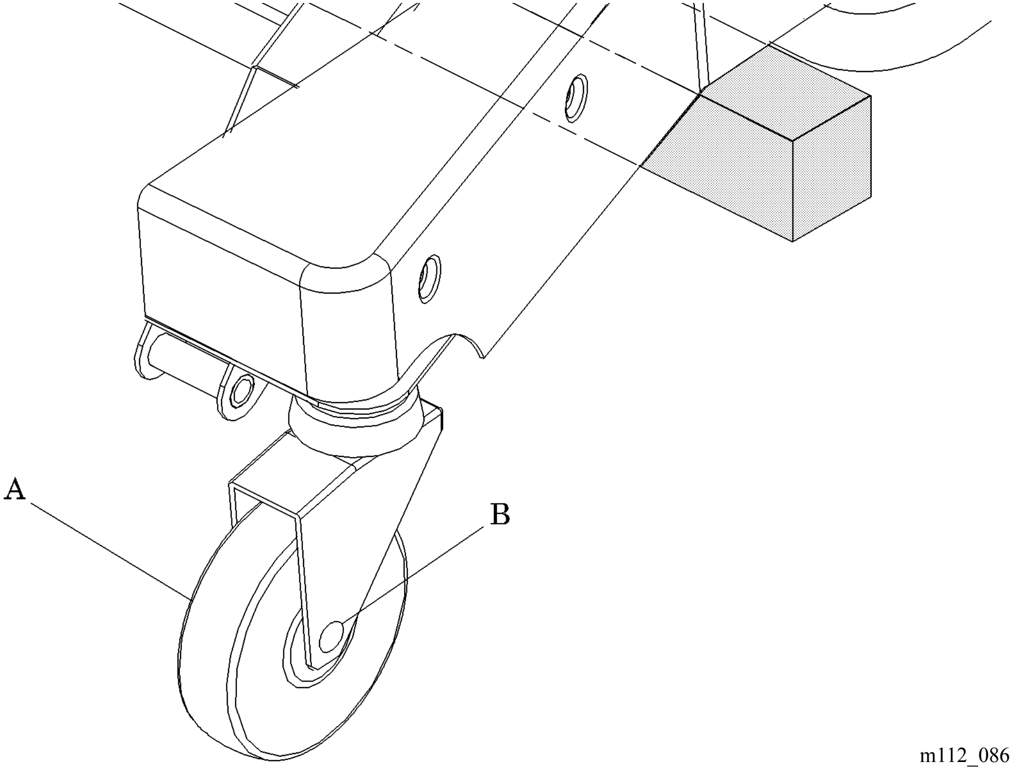
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-9. Caster Wheel (P1900A)



6. Using a T25 Torx®[1] wrench, remove the head end base and the tub base covers for access to the caster hex rod (refer to procedure 4.3).
7. Ensure that the brake/steer pedal is in the neutral position.
8. Jack up the end of the bed.
    a. The foot end caster wheels.
    b. The head end caster wheels, (refer to procedure 4.7).
9. Using a ½" socket wrench and a ½" open end wrench, remove the wheel axle nut (B).
10. Using a ball peen hammer, lightly tap the wheel axle bolt, and remove the axle while supporting the weight of the caster wheel (A).
11. Remove the caster wheel (A) from the caster assembly.

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Replacement

1. Ensure that the replacement caster wheel (A) is the same type as the one removed.
2. Perform the removal procedure in reverse order.
3. Using a ½" deep well socket and torque wrench, tighten the wheel axle nut (B) to 60 in-lb (6.8 N·m) of torque.
4. Check the caster assembly for proper adjustment.
5. Remove the jack, and set the caster brakes.
6. Remove the wheel blocking.
7. Verify and adjust the brake and the brake set operation.
8. Remove the hilow cylinder brace (refer to procedure 4.4).
9. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

Adjustment

1. Ensure the brake/steer pedal is in the neutral position.
2. Using a ¼" drift punch and ball peen hammer, gently tap the connecting clamp clockwise to tighten and counterclockwise to loosen the brake pressure.
3. Adjust the gap between the brake shoe and the caster wheel (A) to 0.073" ± 0.023" (1.85 mm ± 0.58 mm).
4. Using the 0.073" feeler gauge, check the gap between the brake shoe and the caster wheel (A).
5. Using the brake/steer foot pedal, apply the brakes. Verify that the caster wheel (A) is locked.
6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.9 Brake Set Sensor

Tools required:
Hilow cylinder brace (P/N SA1695)
6" #2 phillips head screwdriver
¼" nut driver
Needle nose pliers
¼" deep socket
Torque wrench, 0 in-lb to 25 in-lb (0 N·m to 2.8 N·m)

Removal

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

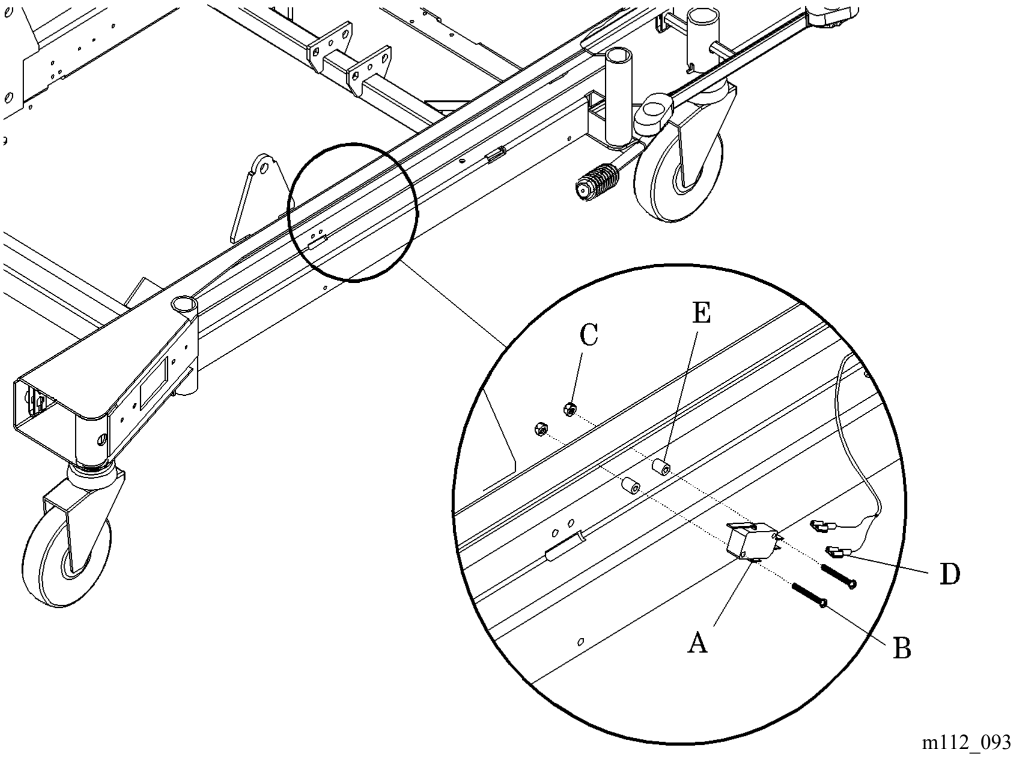
SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

WARNING:
Install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

4. Install the hilow cylinder brace (refer to procedure 4.4).
5. Ensure that the brake/steer pedal is in the neutral position.
6. Using the needle nose pliers, remove the two spade-connected wires (D) from the brake set sensor switch (A) (see figure 4-10 on page 4-39).

Figure 4-10. Brake Set Sensor



7. Using a #2 phillips head screwdriver, remove the two bolts (B), two nuts (C), two spacers (E), and the brake set sensor switch (A) from the base frame.

Replacement

1. Ensure that the replacement parts are the same type as the ones removed.
2. Perform the removal procedure in reverse order.
3. Using the bolts (B) and nuts (C), finger-tighten the brake set sensor switch (A) and spacers (E) to the base frame.

⚠ **CAUTION:**
Do not overtighten the bolts. Damage to the brake set sensor switch could occur.

4. Using a #2 phillips screwdriver and ¼" nut driver, tighten the bolts (B) that secure the brake set sensor (A) to the base frame. Do not overtighten the bolts (B).

5. Using a ¼" deep well socket and torque wrench, tighten the nuts (C) to 15 in-lb (1.7 N•m) of torque.

6. Verify proper brake and brake set operation. If necessary, adjust the brake and brake set. See “Adjustment (P1900A)” on page 4-29.

7. Remove the hilow cylinder brace (refer to procedure 4.4).

8. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.10 Brake/Steer Linkage

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
8" #2 phillips head screwdriver
0.073" feeler gauge
7/16" deep well socket
Ratchet
¼" drift punch
¼" nut driver
Ball peen hammer
Wheel blocking
Torque wrench, 0 in-lb to 25 in-lb (0 N·m to 2.8 N·m)

Removal

1. Set the brakes.

2. Block the wheels.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).

5. Remove the tub base, top center, and foot end base covers (refer to procedure 4.6) from the base frame (refer to procedure 4.3).

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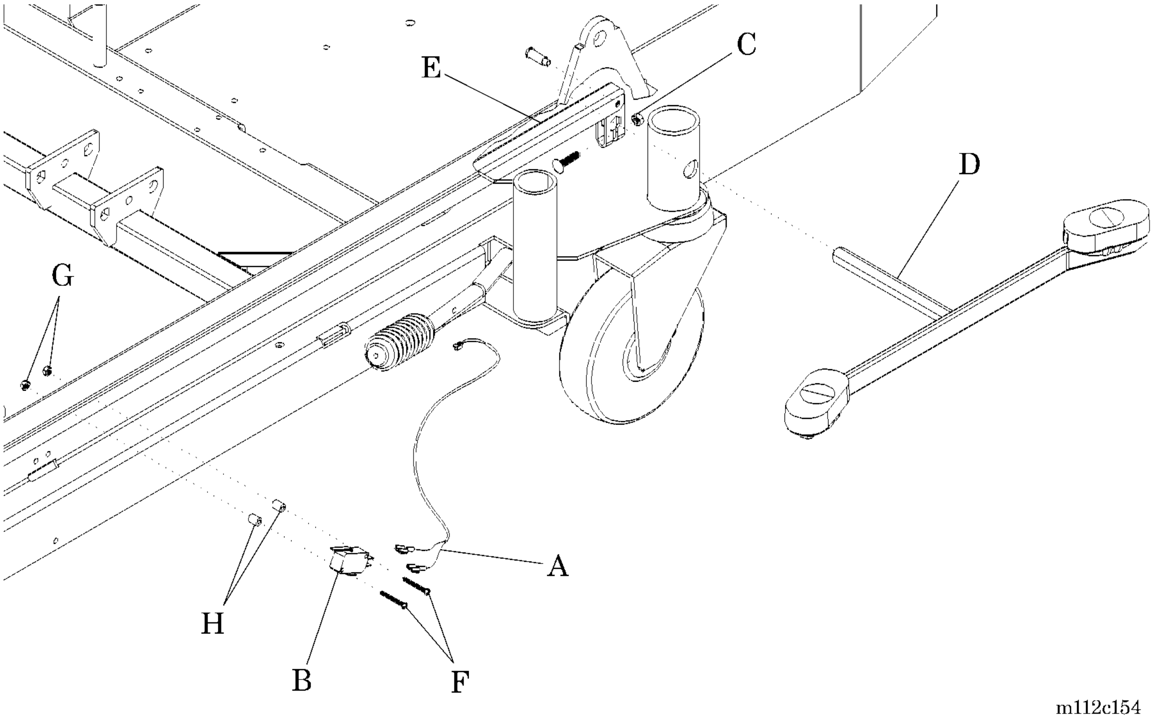
WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

6. Install the hilow cylinder braces (refer to procedure 4.4).

7. For the right-hand brake/steer linkage, remove the brake set sensor switch (B) (see figure 4-11 on page 4-42):

Figure 4-11. Brake/Steer Linkage



   a. Remove the two spade-connected wires (A) from the brake set sensor switch (B).

   b. Using the ¼" nut driver and phillips head screwdriver, remove the two screws (F), spacers (H), and nuts (G).

   c. Remove the brake set sensor switch (B) from the bed frame.

8. Using a 7/16" deep socket wrench, loosen the brake actuator clamps (C), and remove the brake/steer hex rods (D) from the casters.

9. Remove the brake transfer actuator bar (E) from the base frame.

Replacement

1. Ensure that the replacement parts are of the same type as the ones removed.
2. Perform the removal procedure in reverse order.
3. Using the nuts (G), spacers (H), and screws (F), install the brake set sensor switch (B) and the spade connected wires (A).
4. Using a 7/16" deep well socket and torque wrench, tighten the brake linkage clamp bolts (refer to procedure 4.11) to 15 in-lb (1.7 N•m) of torque.
5. Adjust the brake/steer linkage for proper operation. See “Adjustment” on page 4-43.
6. Lock and unlock the brakes using the brake/steer hex rods (D) to verify the adjustment settings.
7. Remove the hilow cylinder brace (refer to procedure 4.4).
8. Install the frame and the caster covers.
9. Remove the wheel blocks.
10. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

Adjustment

1. Ensure that the brake/steer pedal is in the neutral position.
2. Using a ¼" drift punch and ball peen hammer, adjust the brake pressure.
    a. Gently tap the connecting clamp clockwise to increase the brake pressure.
    b. Gently tap the connecting clamp counterclockwise to reduce the brake pressure.
3. Adjust the gap between the brake shoe and the wheel to 0.073" + 0.023" (1.85 mm + 0.58 mm).
4. Using the 0.073" feeler gauge, check the gap between the brake shoe and the wheel.

5. Using the brake/steer foot pedal, apply the brakes. Verify that the wheel is locked.

6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.11 Foot Brake Pedal

Tools required:	Hilow cylinder brace (P/N SA1695) T25 Torx®[1] wrench 7/16" deep socket wrench Ball peen hammer ¼" drift punch Wheel blocking Torque wrench, 50 in-lb to 100 in-lb (5.6 N·m to 11.3 N·m)

Removal

WARNING:
Block the wheels, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Block the wheels.
2. Ensure the brake/steer actuator is in the neutral position.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.
6. Install the hilow cylinder brace (refer to procedure 4.4).
7. Using a 7/16" deep socket wrench, loosen the brake linkage clamp (B) bolt (see figure 4-12 on page 4-46).

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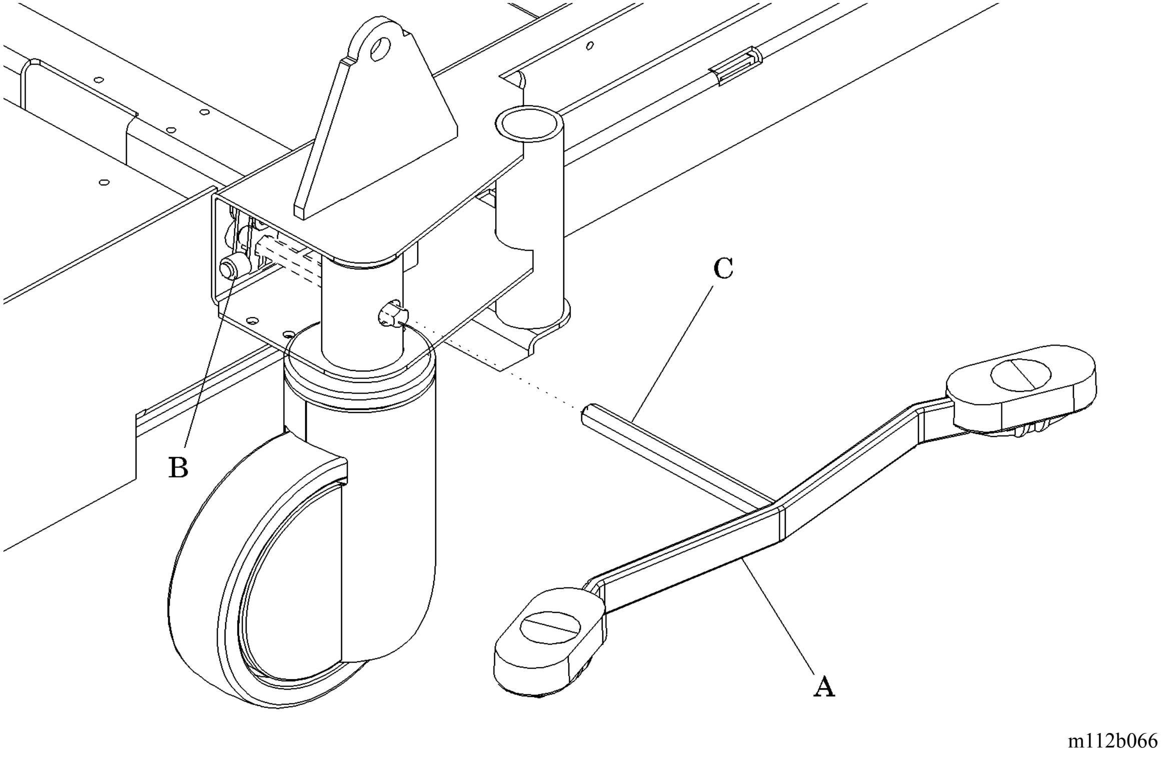
Figure 4-12. Brake Actuator Assembly



8. Pull the actuator hex rod (C) outward, and remove the brake foot pedal assembly (A) from the base frame.

Replacement

1. Perform the removal procedure in reverse order.
2. Ensure that the orange tab goes toward the foot end of the bed.
3. Using a 7/16" deep socket and torque wrench, torque the brake linkage clamp bolt (B) to a torque of 60 in-lb (6.8 N•m).
4. Remove the hilow cylinder brace (refer to procedure 4.4).

Adjustment

1. Ensure that the brake/steer pedal is in the neutral position.
2. Using a ¼" drift punch and ball peen hammer, gently tap the connecting clamp (refer to procedure 4.6) clockwise to increase or counterclockwise to reduce the brake pressure.
3. Adjust the gap between the brake shoe and the wheel to 0.073" + 0.023" (1.85 mm + 0.58 mm).
4. Using the 0.073" feeler gauge, check the gap between the brake shoe and the wheel.
5. Using the brake/steer foot pedal, apply the brakes. Verify that the wheel is locked.
6. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.12 Foot Brake Pedal Pad

Tools required:	Hilow cylinder brace (P/N SA1695) Wheel blocking

Removal

WARNING:
Set the brakes, block the wheels, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

NOTE:
The brake pedal center pad button is red, and the steering pedal center pad button is green.

1. Set the brakes.
2. Block the wheels.

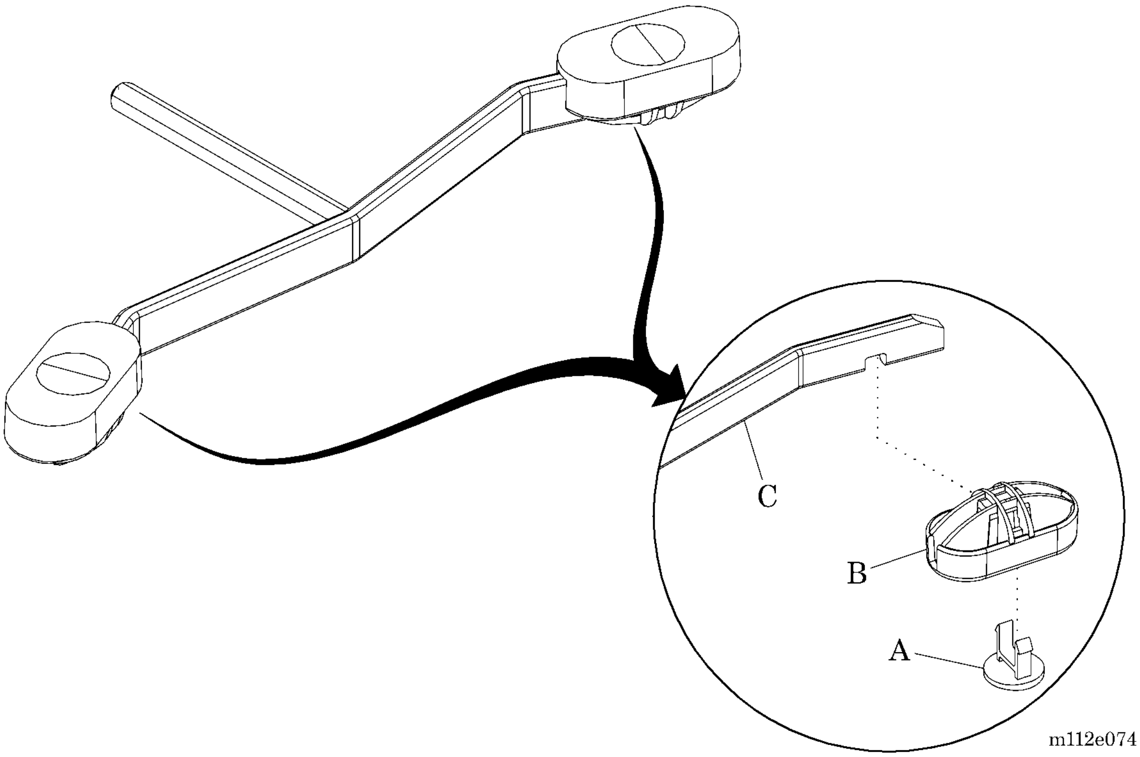
SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.
6. Install the hilow cylinder brace (refer to procedure 4.4).
7. If necessary, raise or lower the bed to gain better access to the foot pump pedal.
8. Squeeze the pedal center pad button (A) (see figure 4-13 on page 4-49).

Figure 4-13. Foot Brake Pedal Pad



9. Push the pedal center pad button (A) through and away from the pedal pad (B).

10. Grasp the pedal pad (B), and pull it from the pedal actuator arm (C).

Replacement

1. Slide the pedal pad (B) onto the pedal actuator arm (C).

NOTE:
The pedal center pad button is red for the brake end and green for the steering end.

2. Insert the pedal center pad button (A) into the pedal pad (B), and press/snap the brake pedal center pad button (A) into place.

3. Remove the hilow cylinder brace (refer to procedure 4.4).

4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.13 Foot Pump Pedal

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
4" needle nose pliers

Removal

WARNING:
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the tub base cover (B) (see figure 4-1 on page 4-19), top center base cover (A), and foot end base cover from the base frame (refer to procedure 4.6) (see figure 4-14 on page 4-51).

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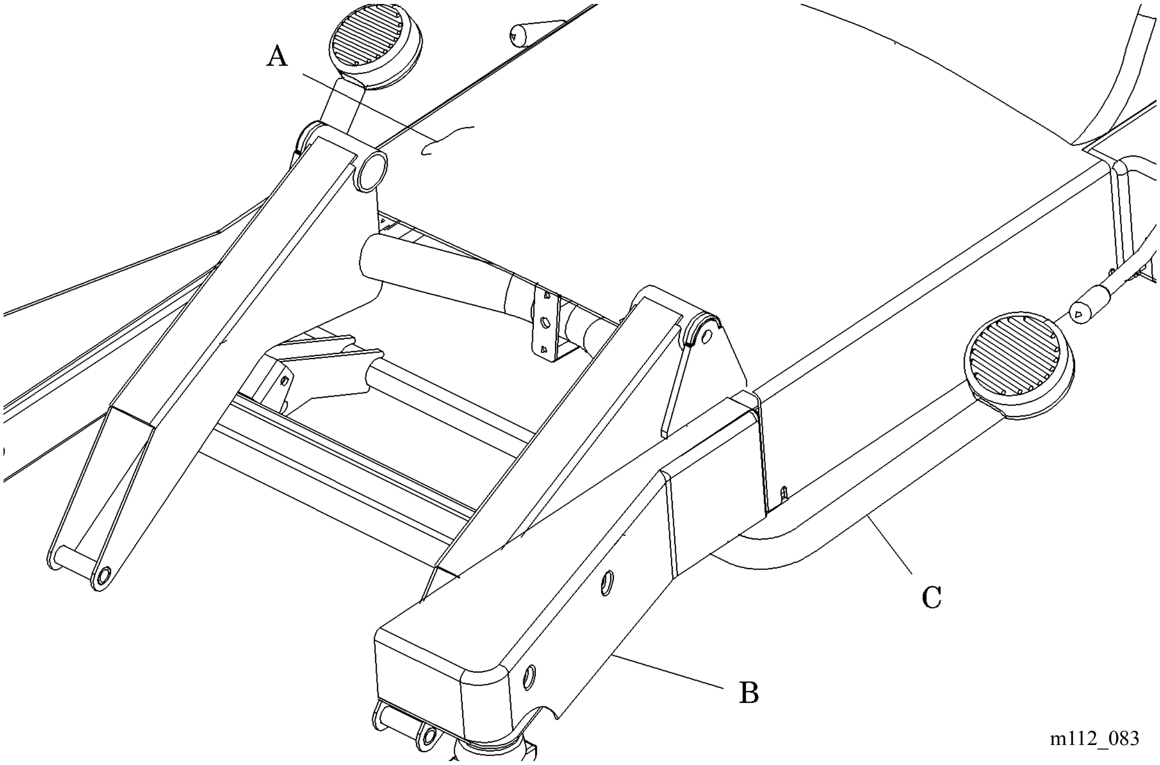
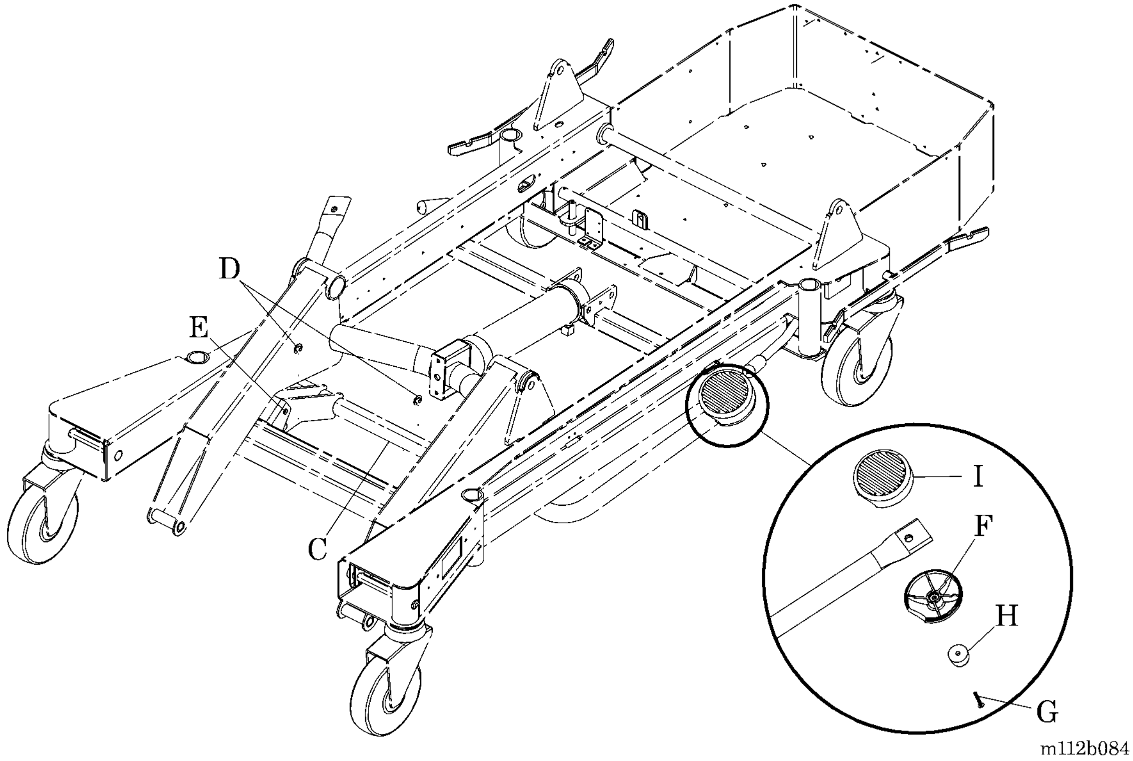
Figure 4-14. Top Center Base and Tub Base Covers



5. Install the hilow cylinder braces (refer to procedure 4.4).
6. Release the tension on the foot pump cable through the adjustment opening at the front of the base tub (see figure 4.3 on page 4-18).
7. Using needle nose pliers, remove the two E-rings (D) and D-pins (E) that secure the foot pump pedal (C) to the base frame (see figure 4-15 on page 4-52).

Figure 4-15. Foot Pump Pedal Actuating Linkage



8. Remove the foot pump pedal (C) from under the base frame.

9. Using a T25 Torx®[1] wrench, remove the two screws (G) and bumpers (H) from the foot pump pedal bottom caps (F).

10. Remove the top foot pump pedal pads (I) from the foot pump pedal (C).

Replacement

NOTE:
While aligning the holes, hold down the lever for the foot pump pedal for connecting the foot pump weldment linkages.

1. Perform the removal procedure in reverse order.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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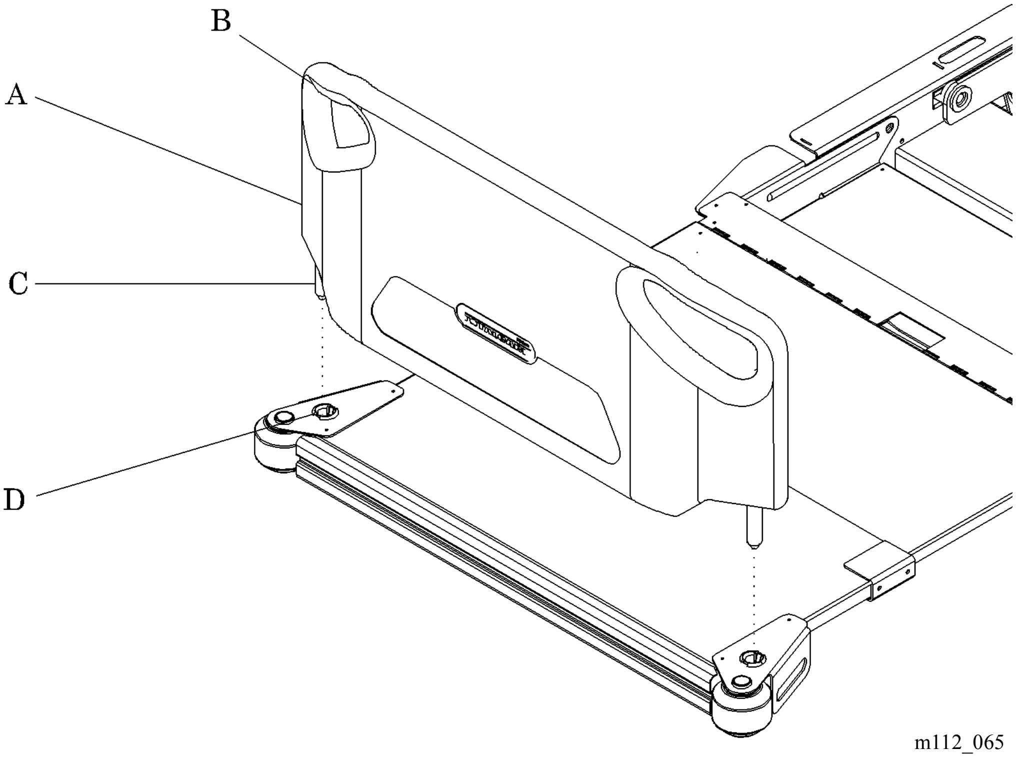
4.14 Footboard

Tools required: None

Removal

1. Grasp the hand-holds (B) on the footboard (A) (see figure 4-16 on page 4-53).

Figure 4-16. Footboard Removal/Replacement



2. Lift up on the footboard (A), and remove it from the frame foot extension.

Replacement

1. Align the footboard posts (C) with the frame mounting holes (D).
2. Slide the footboard posts (C) into the frame mounting holes (D).
3. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.15 Footboard Switch

Tools required: Needle nose pliers
T25 Torx®[1] wrench

Removal

1. Set the brakes.
2. Raise or lower the bed to allow proper access to work on the footboard switch.

⚠ **WARNING:**
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder braces (refer to procedure 4.4).
4. Using the **Bed Flat** switch, place the foot section in the flat position.
5. Remove the footboard (A) from the frame (refer to procedure 4.14) (see figure 4-17 on page 4-55).

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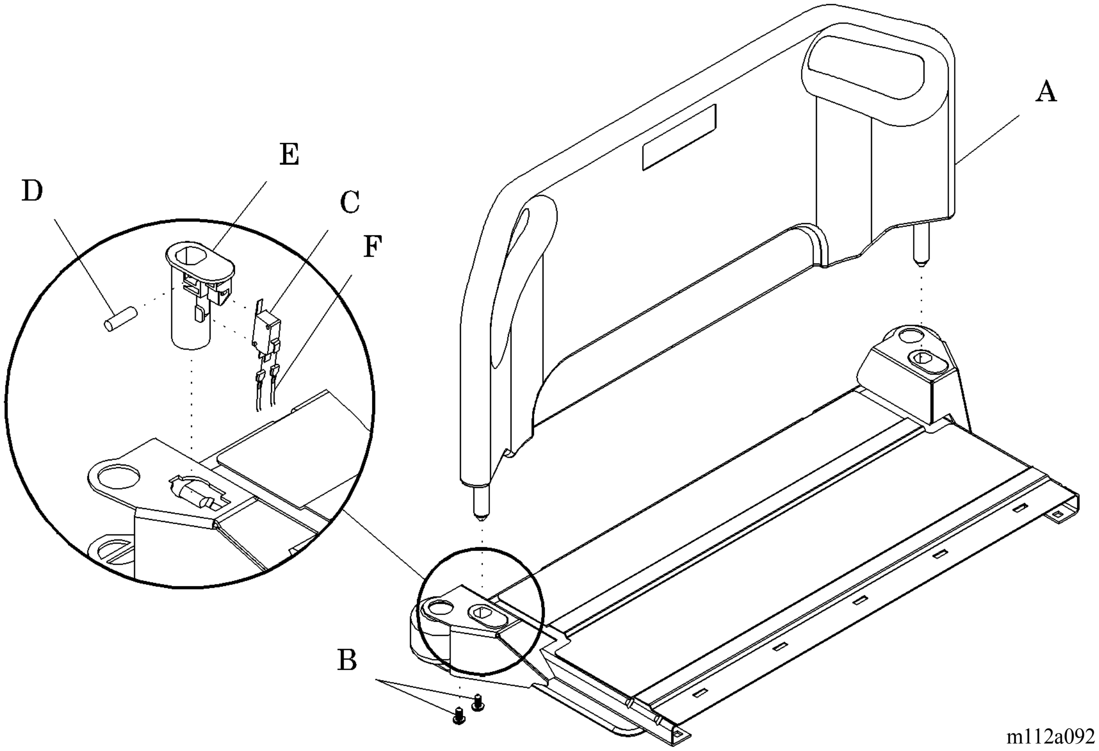
Figure 4-17. Footboard Switch



6. Using a T25 Torx®[1] wrench, remove the two screws (B) that secure the footboard socket (E) to the frame.
7. Rotate and slide out the footboard socket (E) from the frame.
8. Ensure the dowel pin (D) is present in the footboard socket (E) after the footboard socket (E) is removed.
9. Using the needle nose pliers, remove the two wire spade connectors (F) from the footboard switch (C).
10. Remove the footboard switch (C) from the footboard socket (E).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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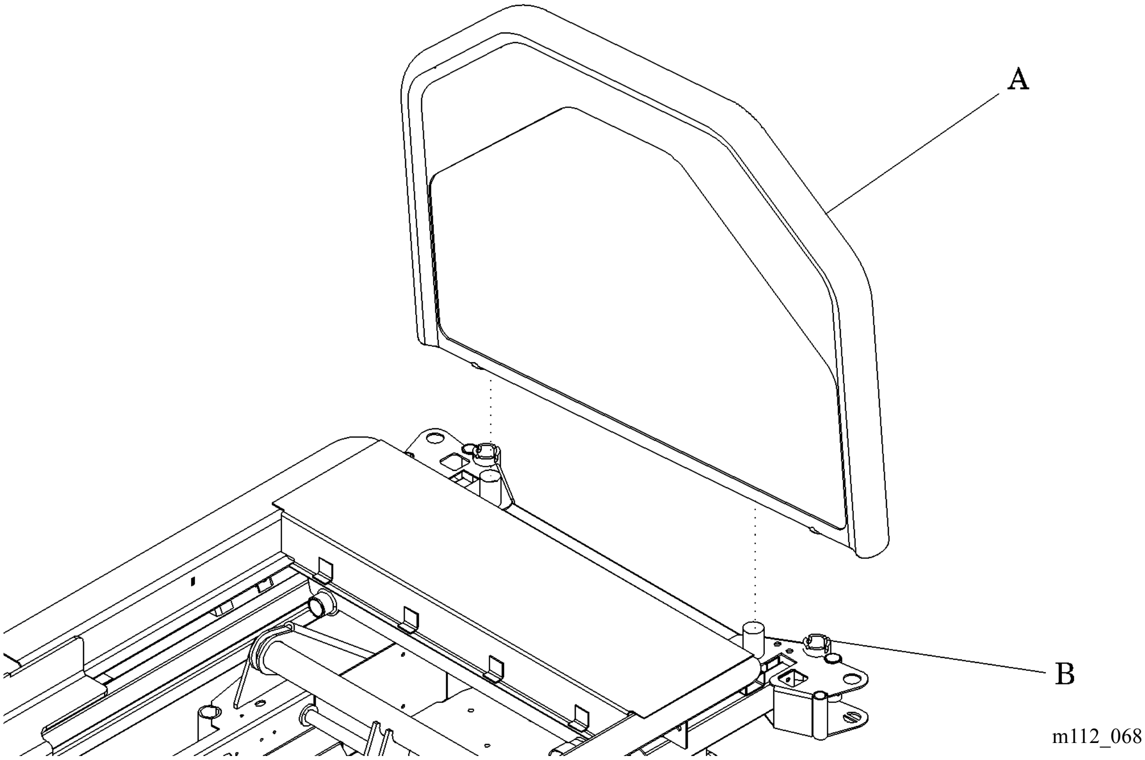
4.16 Headboard

Tools required: None

Removal

1. Grasp the sides of the headboard (A) (see figure 4-18 on page 4-56).

Figure 4-18. Headboard



2. Lift the headboard (A) up and away from the frame mounting holes (B).

Replacement

1. Align the headboard mounting holes with the frame mounting posts (B).
2. Slide the headboard (A) onto the frame mounting holes (B).
3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.17 Head Siderail

Tools required:	T25 Torx® wrench[1]
	Hilow cylinder brace (P/N SA1695)
	Small screwdriver

Removal

WARNING:
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.
5. Install the hilow cylinder brace (refer to procedure 4.4).
6. Raise the head siderail.
7. Unplug the siderail cable from the weigh frame junction box.
8. Remove the cable ties that secure the siderail cable to the frame.
9. Remove the siderail cable from the frame (refer to procedure 4.49).
    a. For the left-hand siderail, reference junction board connector P1.

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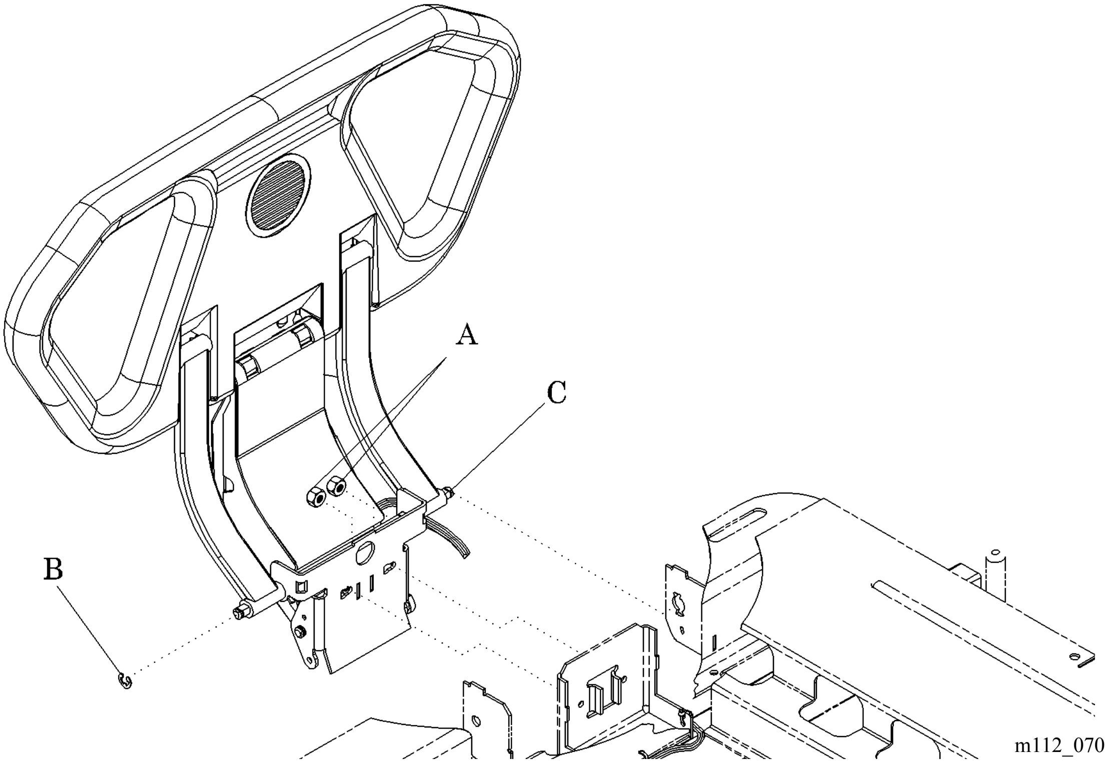
   b. For the right-hand siderail, reference junction board connector P7.

10. Using a T25 Torx®[1] wrench, remove the two keps nuts (A) from the center arm mounting plate (see figure 4-19 on page 4-58).

Figure 4-19. Head Siderail



11. Remove the E-clip (B) from the hinge pin (C).
12. Remove the hinge pin (C).
13. Remove the head siderail with its wiring harness.

Replacement

1. Ensure that the replacement head siderail is the same type as the one removed.
2. Perform the removal procedure in reverse order.
3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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4.18 Head Siderail P.C. Board

Tools required: T10 Torx®[1] wrench
T25 Torx® wrench

Removal

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).

NOTE:
The head end and intermediate siderail removal procedures are identical, except when removing electrical parts. The removal procedure varies with the type of siderail product features. Consult the individual instruction sheet for your added accessories.

3. To allow easy access to the head siderail P.C. board, raise the head end or intermediate siderail.
4. Using a T25 Torx® wrench, remove the four panel mounting screws (A) from the head siderail panel (B) (see figure 4-20 on page 4-60).

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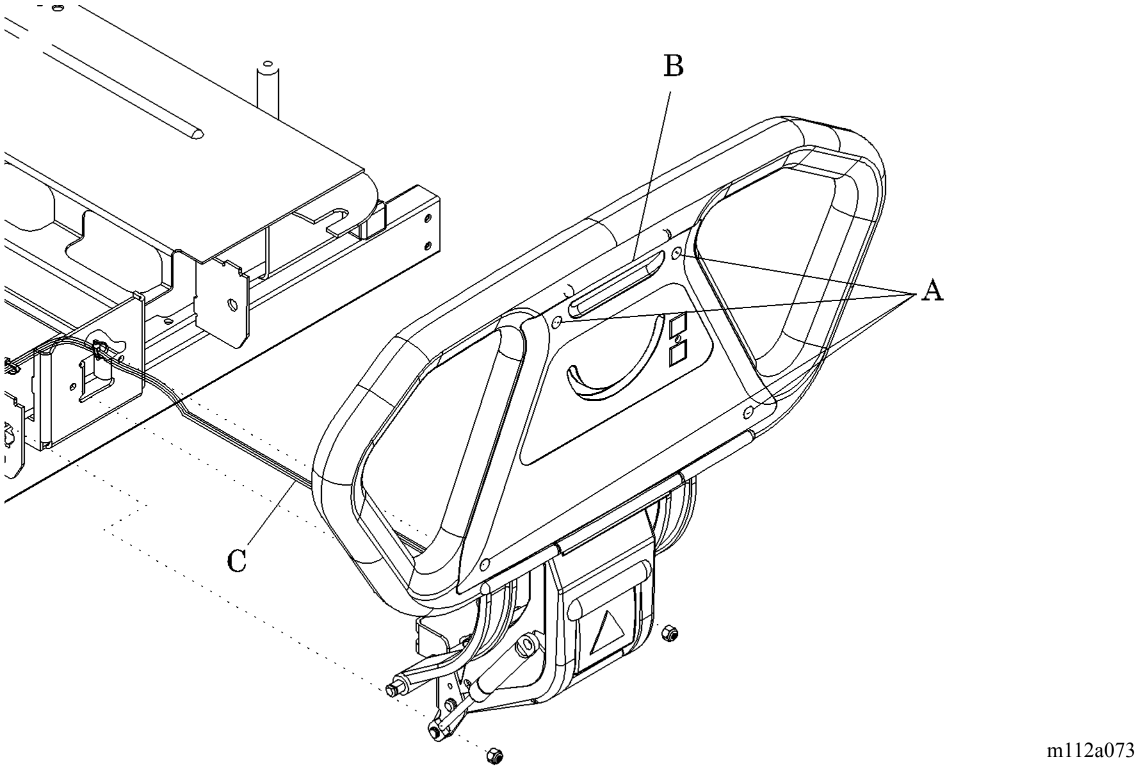
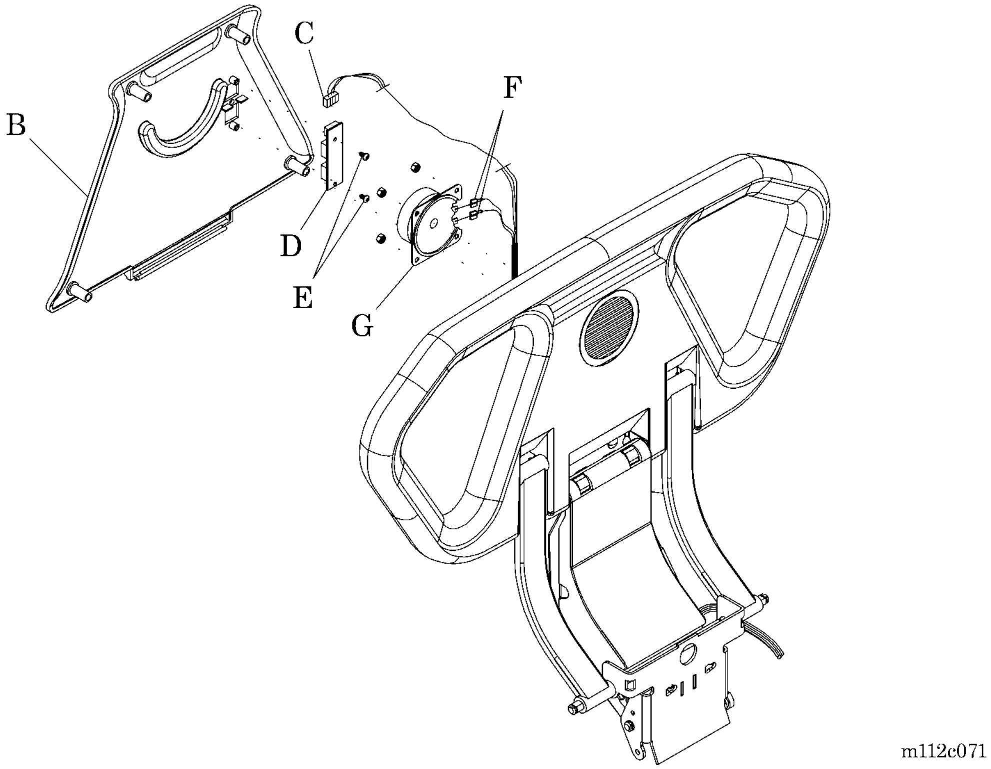
Figure 4-20. Head Siderail Panel



CAUTION:
Use care not to place stress on the connecting cable. Damage to equipment can occur.

5. Carefully separate the head siderail panel (B) from the siderail while supporting the weight of the head siderail panel (B). Use care not to place stress on the connecting cable (C).
6. Disconnect the connecting cable (C) attached to the Head Up/Down P.C. board (D) (see figure 4-21 on page 4-61).

Figure 4-21. Head Siderail P.C. Board Removal



7. Using a T10 Torx®[1] wrench, remove the two retaining screws (E) that secure the Head Up/Down P.C. board (D) to the head siderail panel (B).

8. Remove the Head Up/Down P.C. board (D).

9. Remove the connecting cable (C).
   a. Disconnect both wires (F) attached to the speaker assembly (G).
   b. Remove all cable ties that secure the connecting cable (C) and harness to the frame.

Replacement

1. Ensure that the replacement Head Up/Down P.C. board (D) is the same type as the one removed.

2. Perform the removal procedure in reverse order.

3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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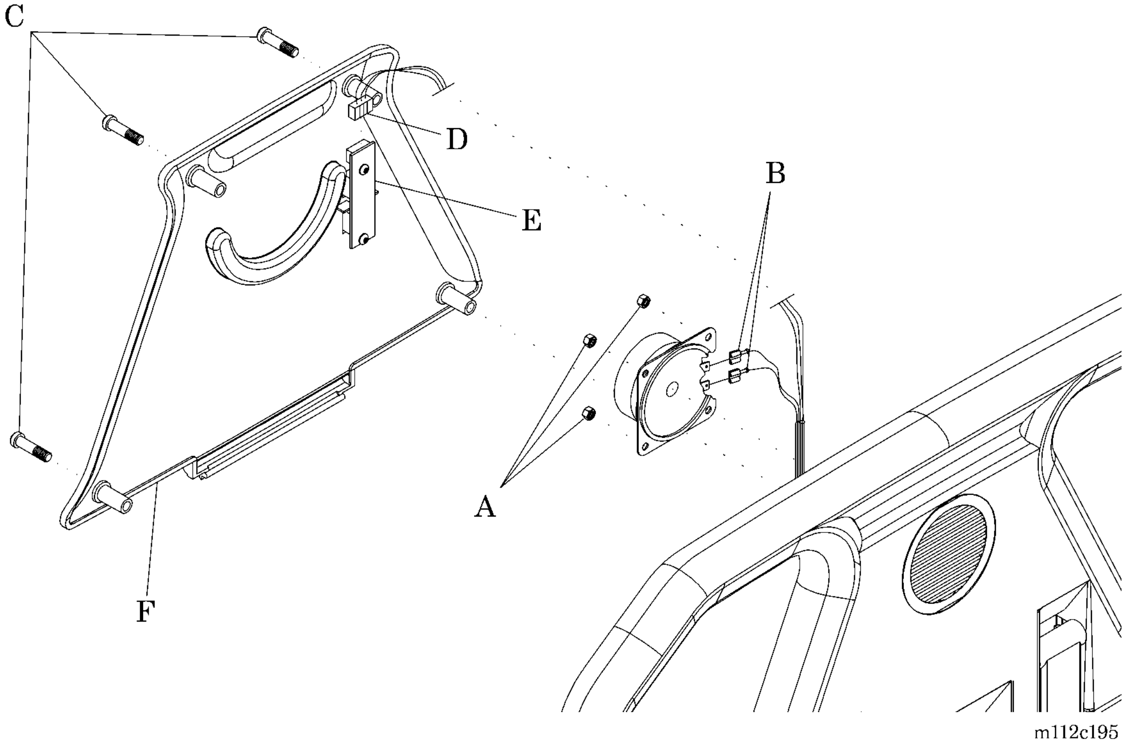
4.19 Speaker

Tools required: T25 Torx®[1] head screwdriver
¼" nut driver

Removal

1. Using the T25 Torx® head screwdriver, remove the four screws (C) from the siderail cover (F) (see figure 4-22 on page 4-62).

Figure 4-22. Speaker Removal



2. Remove the head siderail panel (F).
3. Disconnect cable (D) from the siderail P.C. board (E).
4. Disconnect the speaker wires (B) from the two speaker spade connectors.
5. Using a ¼" nut driver, remove the four mounting nuts (A) securing the speaker to the head siderail.
6. Remove the speaker from the head siderail.

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Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.20 Intermediate Siderail

Tools required: T15 Torx®[1] wrench
T25 Torx® wrench

Removal

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).

NOTE:
Disconnect the intermediate siderail cabling from the wiring harness. The intermediate siderail cable should remain with the removed siderail.

3. Disconnect the intermediate siderail cabling from the wiring harness as follows:
    a. Remove all the cable ties from the harness.
    b. Disconnect the in-line harness connector at the weigh frame junction electrical box (plug P10 left and plug P3 right).
4. Using a T25 Torx® wrench, remove the two keps nuts (A) from the center arm mounting plate (see figure 4-23 on page 4-65).
5. Remove the bushing (B).
6. Remove the E-clips (C) from the hinge pin.
7. Remove the intermediate siderail and the wiring harness.

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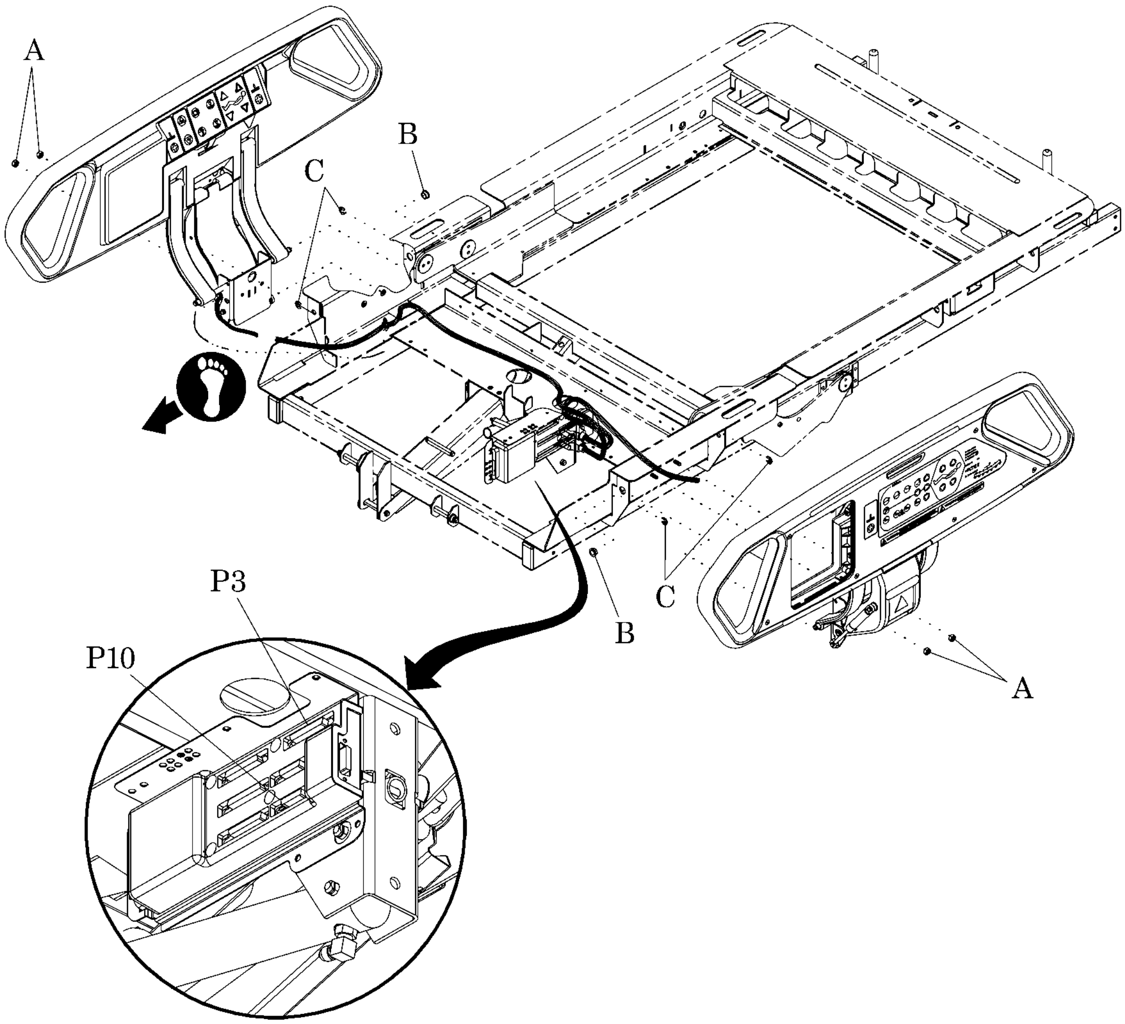
Figure 4-23. Intermediate Siderail



m112e069

Replacement

1. Perform the removal procedure in the reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.21 Main Caregiver P.C. Board or Patient Control Switch P.C. Board

Tools required:	T10 Torx®[1] wrench
	T25 Torx® wrench

Removal

NOTE:
Do not remove the intermediate siderail from the bed to service the main caregiver P.C. board or patient control switch P.C. board.

1. For P1900D model beds, ensure the software revision, located on the EPROM, is revision 009 or higher.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26).
5. Using a T25 Torx® wrench, remove the eight screws (A) that secure the front panel to the intermediate siderail (see figure 4-24 on page 4-68).

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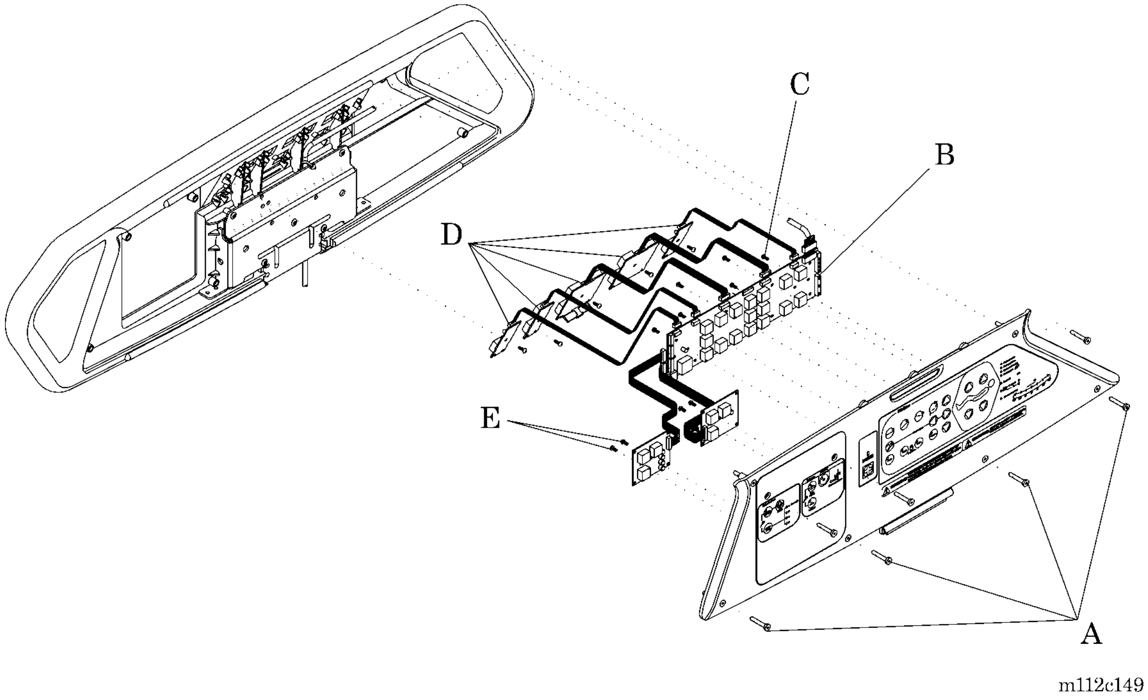
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-24. Intermediate Siderail P.C. Board Removal



CAUTION:
Support the weight of the front panel to prevent stress on the interconnecting P.C. board cable. Failure to do so could result in equipment damage.

6. Support the weight of the front panel, and carefully separate the front panel from the intermediate siderail.

7. Using a T10 Torx®[1] wrench, loosen the P.C. board mounting screws (C).

8. Disconnect all cable connectors from the main caregiver P.C. board (B) or the patient control switch P.C. board (D) to be removed.

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

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[1] Torx® is a registered trademark for Textron, Inc.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

9. To remove the main caregiver P.C. board (B), perform the following:
    a. Using a T10 Torx®[1] wrench, remove the five mounting screws (C) that secure the main caregiver P.C. board (B) to the intermediate siderail.
    b. Carefully lift the main caregiver P.C. board (B) by its edges from the intermediate siderail.
10. To remove the patient control switch P.C. boards (D), perform the following:
    a. Using a T10 Torx® wrench, remove the mounting screw (E) that secures the patient control switch P.C. board (D) to the intermediate siderail.
    b. Carefully spread the side catches along one edge of the patient control switch P.C. board (D).
    c. Lift out the patient control switch P.C. board (D) from the patient side intermediate siderail.

Replacement

CAUTION:
Do not deform the connector pins of the interconnecting cable. Equipment damage can occur.

1. Perform the removal procedure in reverse order.
2. Install new siderail gaskets (refer to procedure 4.72).
3. Align and firmly insert each interconnecting cable into its corresponding cable connector. Use care not to deform the connector pins.
4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.22 Nurse Call Switch P.C. Board

Tools required: T25 Torx®[1] wrench
T10 Torx® wrench

Removal

NOTE:
Do not remove the intermediate siderail from the bed to service the nurse call control P.C. board.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).

3. Remove the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26).

4. Using a T25 Torx® wrench, remove the eight screws (E) that secure the front panel to the intermediate siderail (see figure 4-25 on page 4-71).

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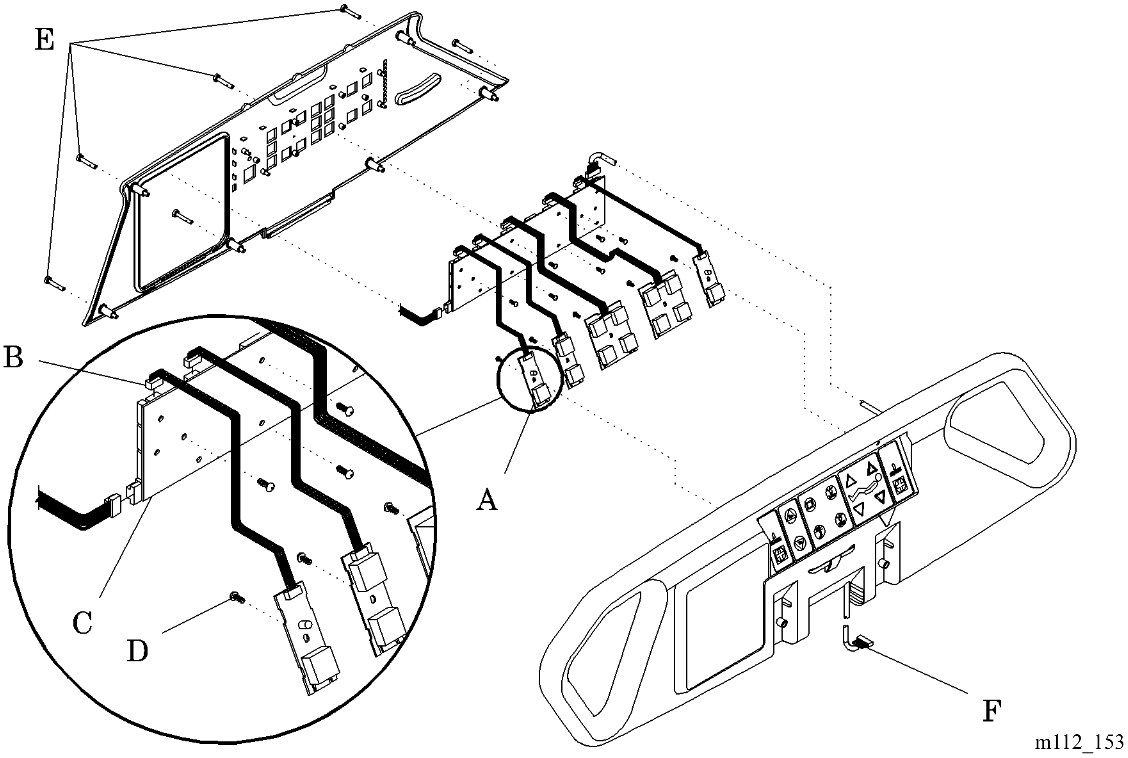
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-25. Nurse Call Control P.C. Board



CAUTION:
Support the weight of the front panel to prevent stress on the interconnecting P.C. board cable. Failure to do so could result in equipment damage.

5. Support the weight of the front panel, and carefully separate the front panel from the intermediate siderail.

6. Disconnect the nurse call control cable connector (B) from P9 or P10 at the caregiver positioning P.C. board (C).

7. Using a T10 Torx®[1] wrench, remove the mounting screw (D) that secures the nurse call P.C. board (A) to the intermediate siderail.

8. Carefully lift the nurse call control from the intermediate siderail.

9. Carefully spread the side catches along one edge of the nurse call P.C. board (A).

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[1] Torx® is a registered trademark of Textron, Inc.

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

10. By its edges, lift the nurse call P.C. board (A) from the intermediate siderail.

Replacement

1. Ensure that the replacement nurse call control P.C. board (A) is the same type as the one removed.

2. Press one edge of the nurse call control P.C. board (A) behind the P.C. board siderail tabs.

3. Carefully snap the nurse call control P.C. board (A) into place.

4. Install new siderail gaskets (refer to procedure 4.72).

CAUTION:
Do not deform the connector pins of the interconnecting cable. Equipment damage can occur.

5. Using care not to deform the connector pins, align and firmly insert the applicable P.C. board interconnecting cable (B) into the caregiver positioning P.C. board (C) connector P9 or P10.

6. Pull the siderail interconnecting cable (F) through the channeling and out through the siderail cable port.

7. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.23 Patient Exit Detection Alarm

Tools required: T25 Torx®[1] wrench
T10 Torx® wrench

Removal

NOTE:
Do not remove the intermediate siderail from the bed to service the Patient Exit Detection P.C. board.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Using a T25 Torx® wrench, remove the two screws (A) that secure the bed setup control panel (B) to the intermediate siderail (see figure 4-26 on page 4-74).

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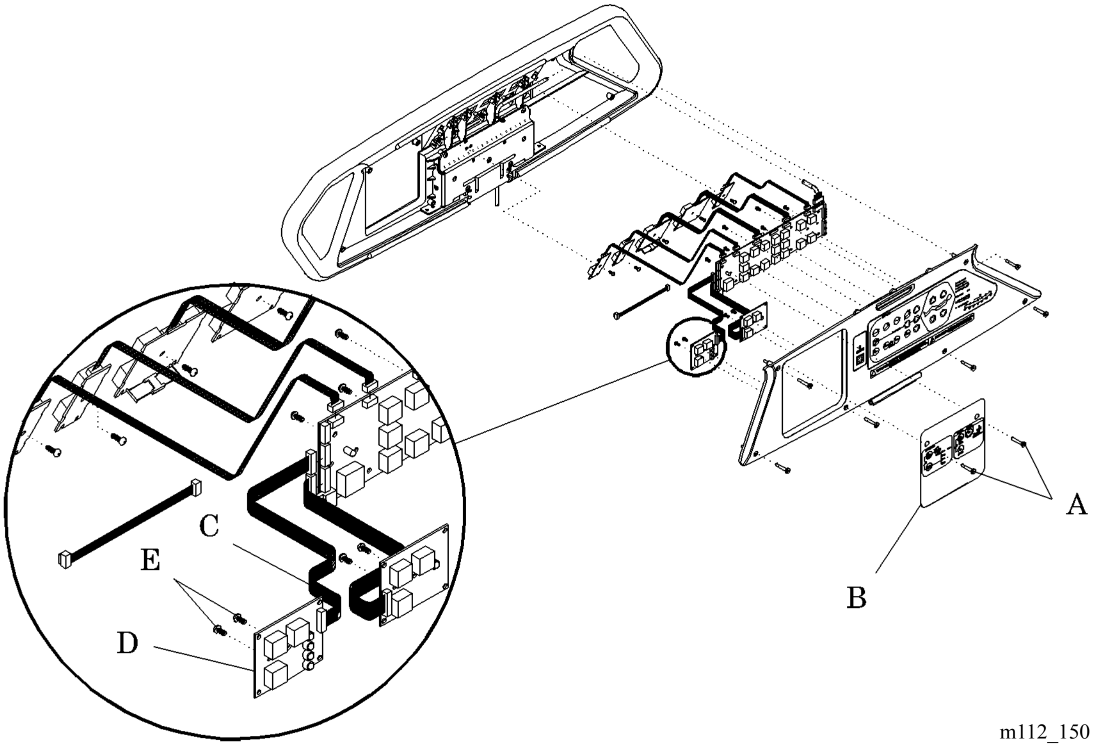
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-26. Patient Exit Detection (PED) P.C. Board



CAUTION:
Support the weight of the bed setup control panel to prevent stress on the interconnecting P.C. board cable. Failure to do so could result in equipment damage.

4. Support the weight of the bed setup control panel (B), and carefully separate the bed setup control panel (B) from the intermediate siderail.
5. Disconnect the Patient Exit Detection (PED) cable connector (C) from the caregiver positioning P.C. board.
6. Using a T10 Torx®[1] wrench, remove the mounting screws (E) that secure the PED P.C. board (D) to the siderail.

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[1] Torx® is a registered trademark of Textron, Inc.

⚠ **CAUTION:**
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

⚠ **CAUTION:**
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

7. Carefully lift the PED P.C. board (D) by its edges from the siderail.

Replacement

1. Ensure that the replacement PED P.C. board (D) is the same type as the one removed.

2. Perform the removal procedure in reverse order.

3. Install new siderail gaskets (refer to procedure 4.72).

⚠ **CAUTION:**
Do not deform the connector pins of the interconnecting cable. Equipment damage can occur.

4. Using care not to deform the connector pins, align and firmly insert each P.C. board interconnecting cable into its P.C. board connector.

5. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.24 Entertainment and Volume Control

Tools required: T25 Torx®[1] wrench
T15 Torx® wrench

Removal

NOTE:
Do not remove the intermediate siderail from the bed to service the entertainment P.C. board.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).

3. Using a T25 Torx® wrench, remove the six screws (A) that secure the front panel (B) to the intermediate siderail (see figure 4-27 on page 4-77).

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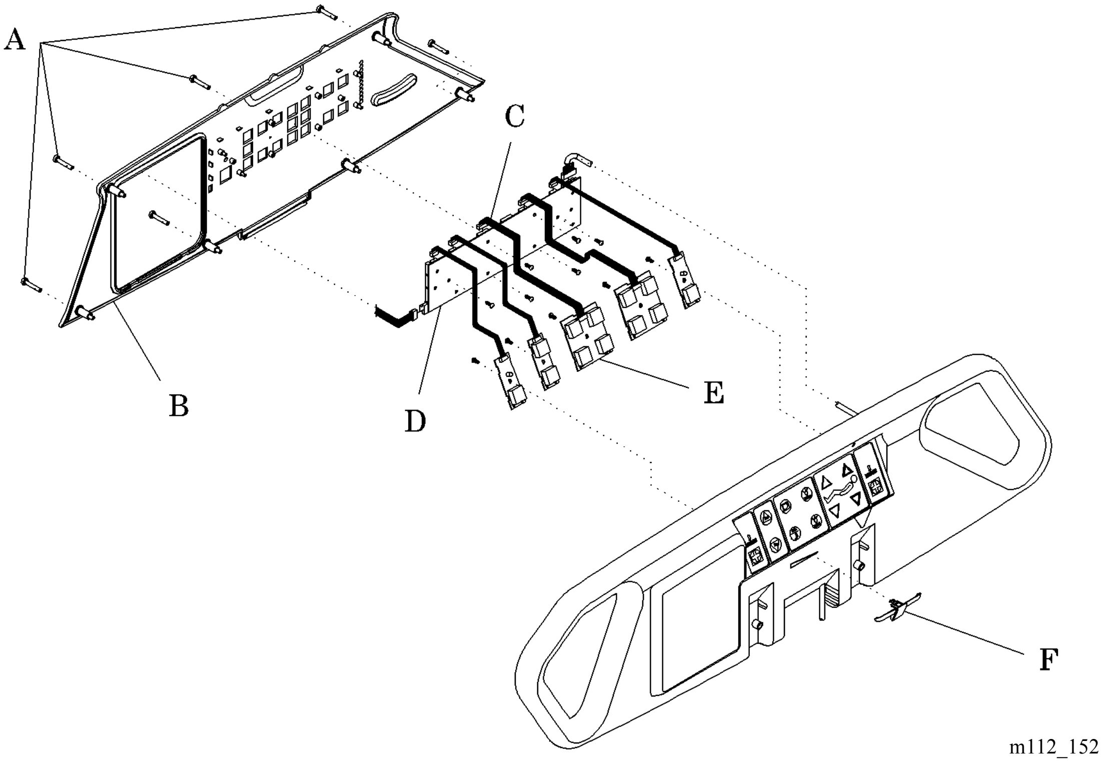
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-27. Entertainment and Volume Control



CAUTION:
Support the weight of the front panel to prevent stress on the interconnecting P.C. board cables. Failure to do so could result in equipment damage.

4. Support the weight of the front panel (B), and carefully separate the front panel (B) from the siderail.
5. Disconnect the entertainment cable connector (C) from the caregiver positioning P.C. board (D).

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

6. To remove the entertainment P.C. board (E), perform the following:
    a. Using a T15 Torx®[1] wrench, remove the P.C. board mounting screw.
    b. Carefully lift the entertainment P.C. board (E) by its edges from the intermediate siderail.
    c. Carefully spread the side catches along one edge of the entertainment P.C. board (E).
    d. Lift out the entertainment P.C. board (E) by its edges from the patient side intermediate siderail.
7. To remove the volume control slide switch (F), disengage the patient volume slide from the P.C. board volume slide tab.

Replacement

CAUTION:
Do not deform the connector pins of the interconnecting cable. Equipment damage can occur.

1. Perform the removal procedure in reverse order.
2. Install new siderail gaskets (refer to procedure 4.72).
3. Use care not to deform the connector pins when aligning and firmly inserting the entertainment P.C. board (E) interconnecting cable into the caregiver positioning P.C. board connector P2.
4. Pull the siderail interconnecting cable (C) through the channeling and out through the siderail cable port.
5. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.25 Sleep Surface Siderail Controls

Tools required: T25 Torx®[1] wrench
T10 Torx® wrench

Removal

NOTE:
Do not remove the intermediate siderail from the bed to service the sleep surface control P.C. board.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Using a T25 Torx® wrench, remove the two screws (A) that secure the bed setup control panel (B or F for pulmonary beds) to the intermediate siderail (see figure 4-28 on page 4-80).

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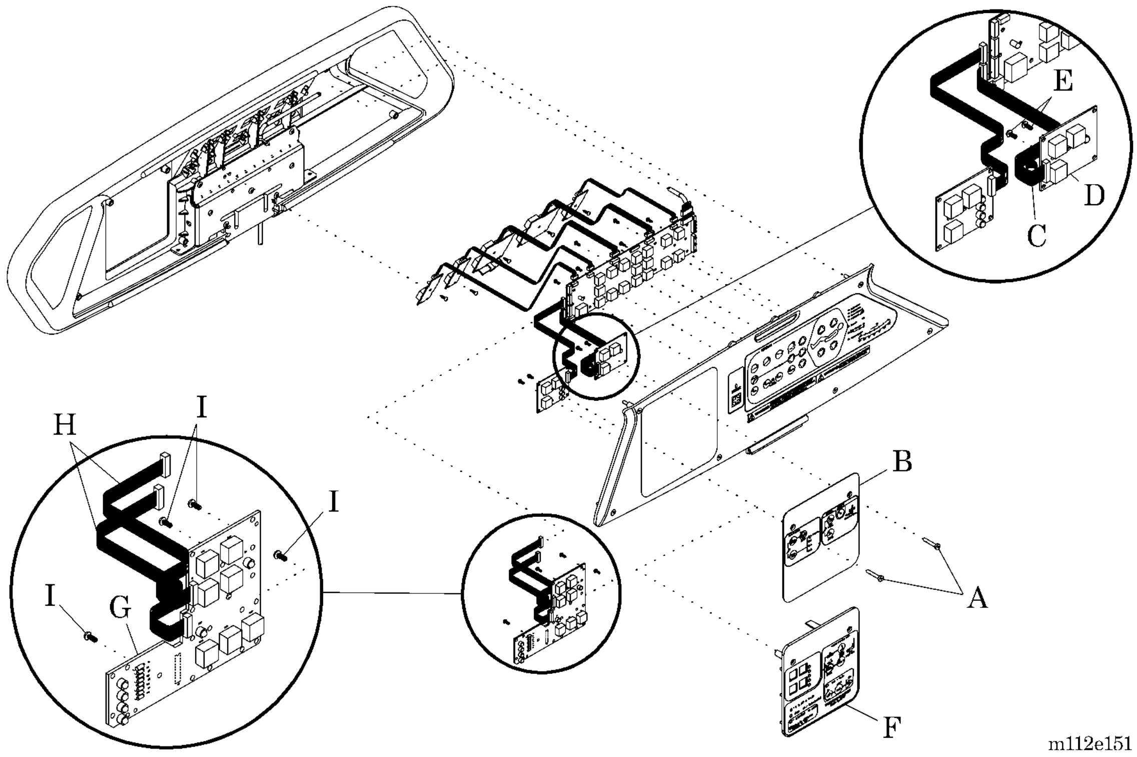
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-28. Siderail Sleep Surface Control Module



CAUTION:
Support the weight of the bed setup control panel to prevent stress on the interconnecting P.C. board cables. Failure to do so could result in equipment damage.

4. Support the weight of the bed setup control panel (B or F), and carefully separate the bed setup control panel (B or F) from the siderail.

5. Disconnect the sleep surface control cable connector P3 (C or H for pulmonary beds) from the sleep surface control P.C. board (D or G for pulmonary beds).

6. Using a T10 Torx®[1] wrench, remove the mounting screws (E or I for pulmonary beds) that secure the sleep surface control P.C. board (D or G) to the intermediate siderail.

7. Carefully spread the side catches along one edge of the sleep surface control P.C. board (D or G).

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[1] Torx® is a registered trademark of Textron, Inc.

⚠ **CAUTION:**
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

⚠ **CAUTION:**
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

8. By its edges, lift the sleep surface control P.C. board (D or G) from the patient side intermediate siderail.

Replacement

1. Ensure that the replacement sleep surface control P.C. board (D or G) is the same type as the one removed.

2. Press one edge of the sleep surface control P.C. board (D or G) behind the P.C. board siderail tabs.

3. Carefully snap the sleep surface control P.C. board (D or G) into place.

4. Install new siderail gaskets (refer to procedure 4.72).

⚠ **CAUTION:**
Do not deform the connector pins of the interconnecting cable. Equipment damage can occur.

5. Using care not to deform the connector pins, align and firmly insert the P.C. board interconnecting cable (C or H) into the sleep surface control P.C. board (D or G) connector P3.

6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.26 Graphical Caregiver Interface (GCI)® Control

Tools required: T25 Torx®[1] wrench
T10 Torx® wrench
¼" nut driver
3/16" socket
Ratchet

Removal

1. For P1900D model beds, ensure the software revision, located on the EPROM, is revision 009 or higher.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Using a T25 Torx® wrench, remove the two mounting screws (A) that secure the Graphical Caregiver Interface (GCI)® Control enclosure (B) to the right caregiver intermediate siderail (see figure 4-29 on page 4-83).

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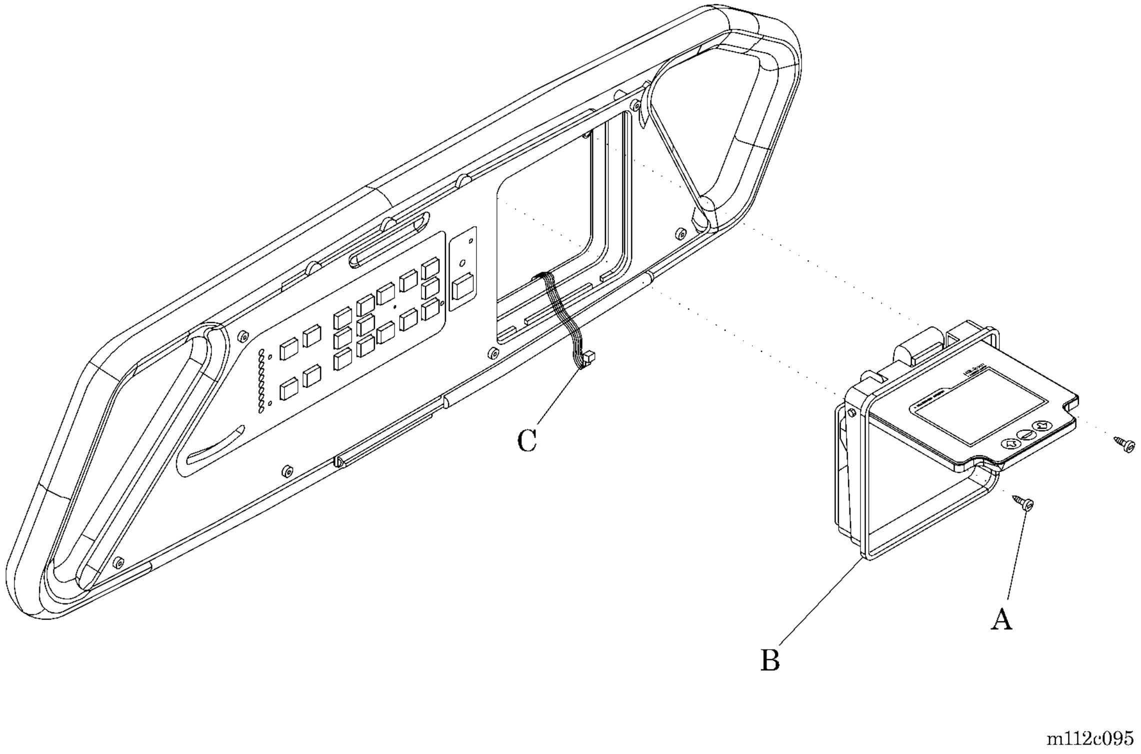
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-29. Graphical Caregiver Interface (GCI)® Control



5. Gently pull the Graphical Caregiver Interface (GCI)® Control enclosure (B) from the siderail, and disconnect the ribbon cable connector P6 (C) from the Graphical Caregiver Interface (GCI)® Control.

Replacement

1. Perform the Graphical Caregiver Interface (GCI)® Control removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.27 Head Angle Indicator/Trendelenburg Indicator

Tools required:	Thin applicator knife (optional) Clean, soft cloth

NOTE:
The head angle indicator and Trendelenburg indicator replacement procedures are the same; the differences are the location. The head angle indicator is located on the head siderail, and the Trendelenburg indicator is located on the intermediate siderail.

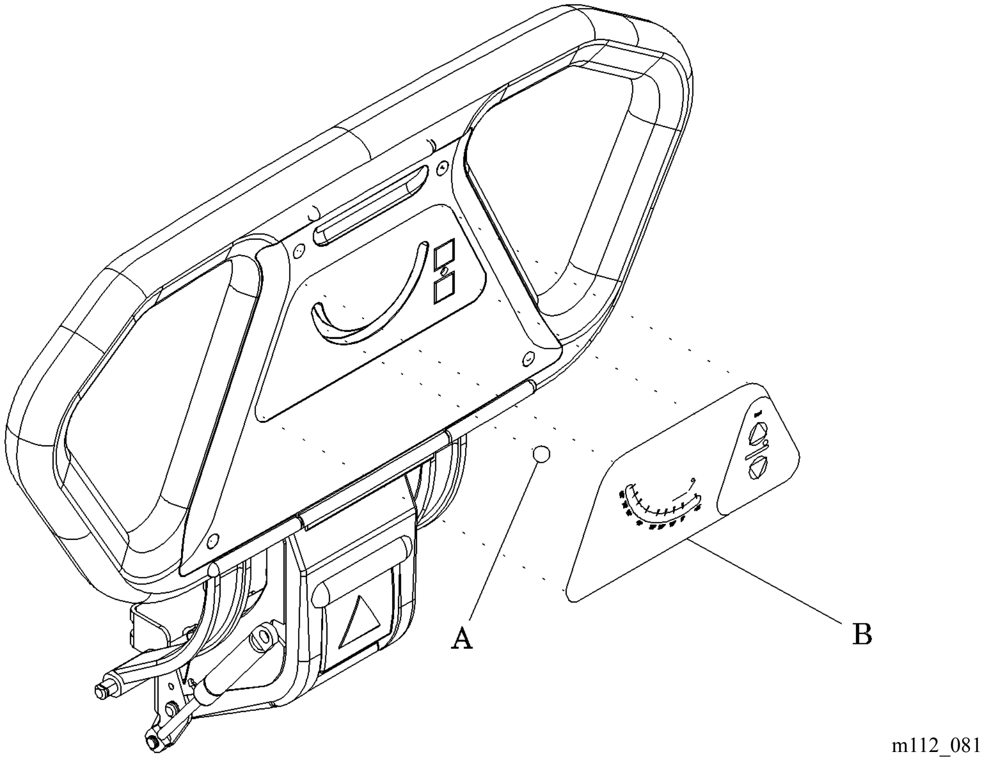
NOTE:
The indicator ball is sealed in the roller groove behind the removable plastic laminate.

Removal

1. Remove the plastic laminate (B) (see figure 4-30 on page 4-85).
   a. Use your fingernail or a thin applicator knife to pry up the edge of the plastic laminate (B).
   b. Peel the plastic laminate (B) in a swift motion from the face of the siderail.

NOTE:
The head angle indicator is shown in figure 4-30 on the head siderail. The Trendelenburg indicator is located on the intermediate siderail.

Figure 4-30. Head Angle Indicator



2. Remove the indicator ball (A) from the roller groove.

Replacement

1. Place the indicator ball (A) into the roller groove.
2. Align the plastic laminate (B) with the siderail face.
3. With the protective backing partially peeled away, align and apply a tacky edge of the plastic laminate (B) to the face of the siderail.
4. Ensure that the indicator ball (A) is in the roller groove.

⚠ **CAUTION:**
Avoid getting wrinkles or air pockets in the surface of the plastic laminate. Equipment damage can occur.

5. Remove the remaining protective backing, and slowly apply the plastic laminate (B) to the face. Avoid creating wrinkles or air pockets in the surface of the plastic laminate (B).

6. Smooth out the plastic laminate (B), and apply firm pressure to set the plastic laminate (B) adhesive.

7. Wipe the plastic laminate (B) face with a clean, soft cloth, and return the siderail to service.

8. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.28 Hydraulic System Oil Fill

Tools required: Small funnel
5/8" open end wrench
Hydraulic oil (P/N 36199s)

1. Place the bed in the following position:
   - Bed fully raised
   - Head down
   - Knee down
   - Foot fully extended and raised
2. Remove the tub base cover (refer to procedure 4.3).
3. Using the 5/8" wrench, remove the plug (A) from the hydraulic reservoir (B):
   - On a P1900A or P1900B model, refer to figure 4-31 on page 4-88.
   - On a P1900C or newer model, refer to figure 4-32 on page 4-88.

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

4. Using the funnel and hydraulic oil (P/N 36199s), fill the reservoir to the **Level B** (C).
5. Install the plug (A) into the hydraulic reservoir (B).
6. Cycle the bed up and down to check for leaks.
7. If no leaks are present, install the tub base cover (refer to procedure 4.3).

Figure 4-31. Hydraulic Oil Filling (P1900A and P1900B Models)

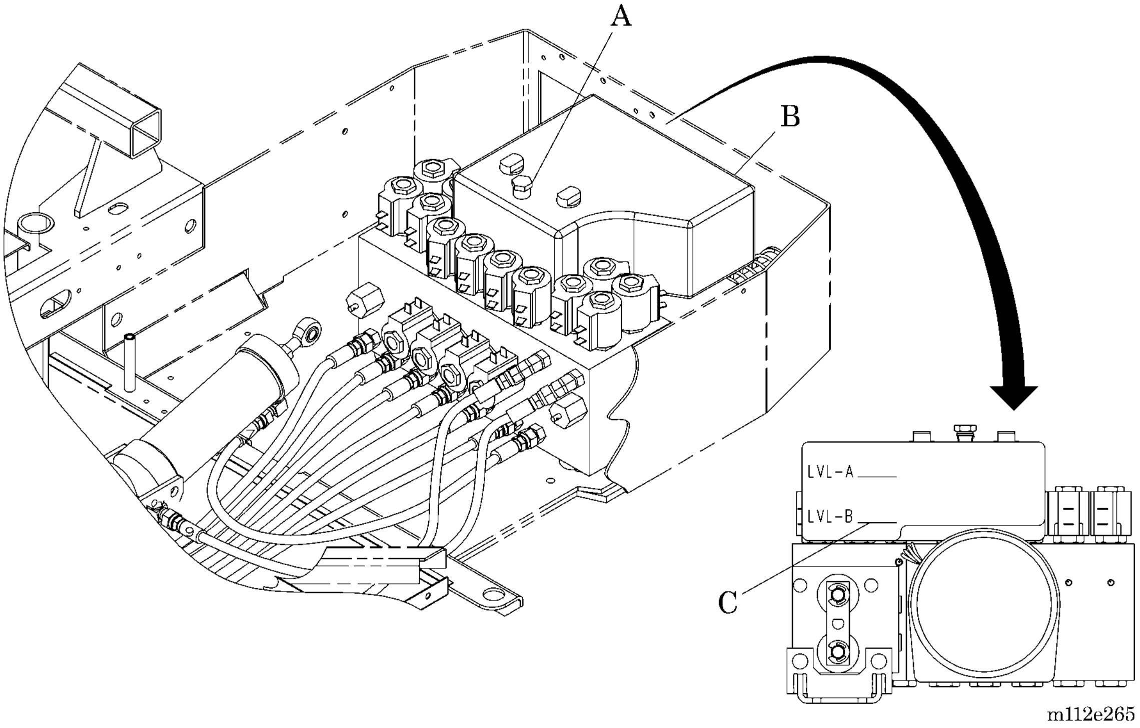
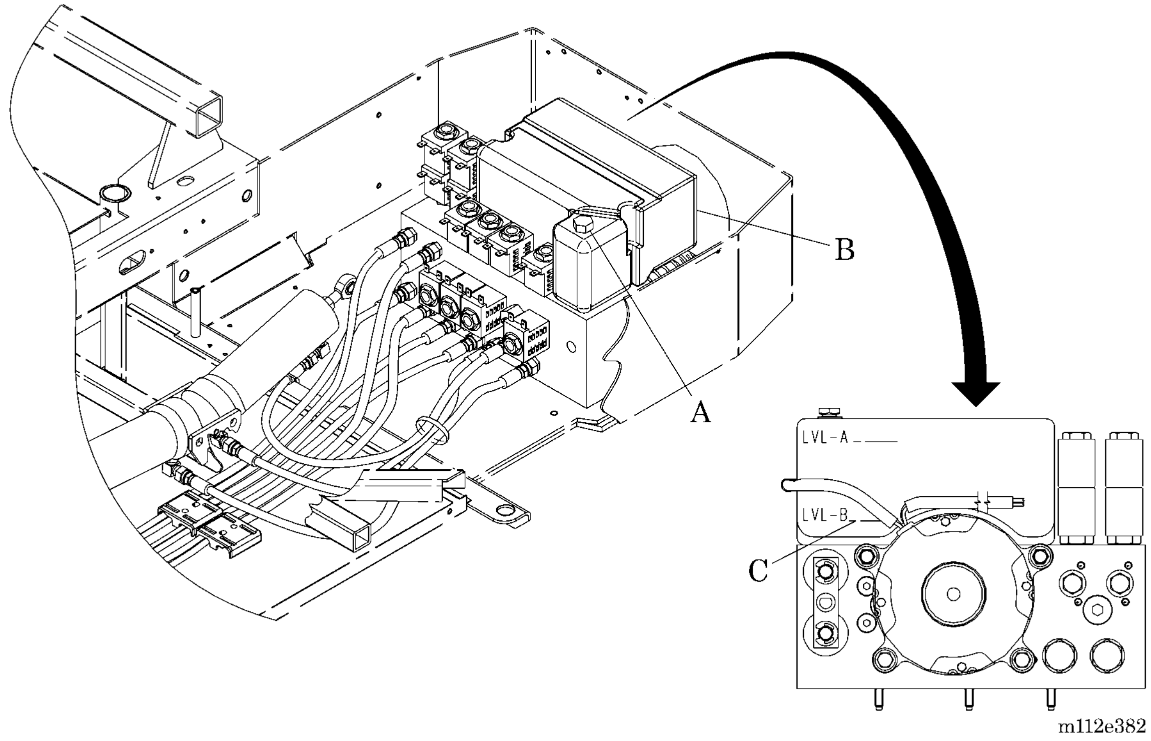

A
B
LVL-A
LVL-B
C
m112e265

Figure 4-32. Hydraulic Oil Filling (P1900C and Newer Models)


B
A
LVL-A
LVL-B
C
m112e382

4.29 Hydraulic Manifold Valve Coil

Tools required:	Hilow cylinder brace (P/N SA1695)
	¾" open end wrench
	4" needle nose pliers

Removal

1. Set the brakes.

CAUTION:
The hilow cylinder braces must be in position to prevent damage to the bed's frame during this procedure.

2. Raise the bed to the high position.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

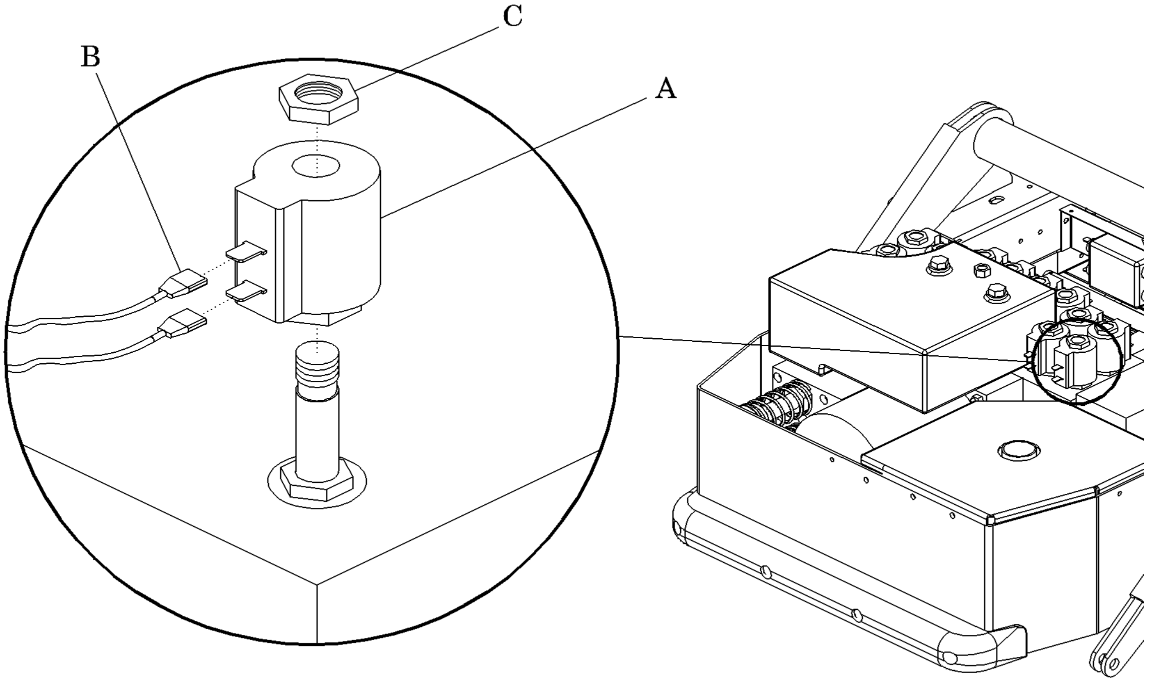
4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).

6. Using the needle nose pliers, remove both wire spade connectors (B) from the valve coil (A) (see figure 4-33 on page 4-90).

Figure 4-33. Hydraulic Valve Coil



m112b080

7. Using a ¾" open end wrench, remove the mounting nut (C) from the top end of the valve core.
8. Lift the valve coil (A) from the valve core.
9. Remove the valve coil (A).

Replacement

1. Ensure that the valve coil (A) is of the same type as the one removed.
2. Perform the removal procedure in reverse order.
3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.30 Hydraulic Valve

Tools required: Hilow cylinder brace (P/N SA1695)
7/8" deep well socket
Basting syringe
Ratchet
Tygon®[1] flexible hose

Removal

1. Set the brakes.

CAUTION:
The hilow cylinder braces must be in position to prevent damage to the bed's frame during this procedure.

2. Raise the bed to the high position.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).

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[1] Tygon® is a registered trademark of Norton Company.

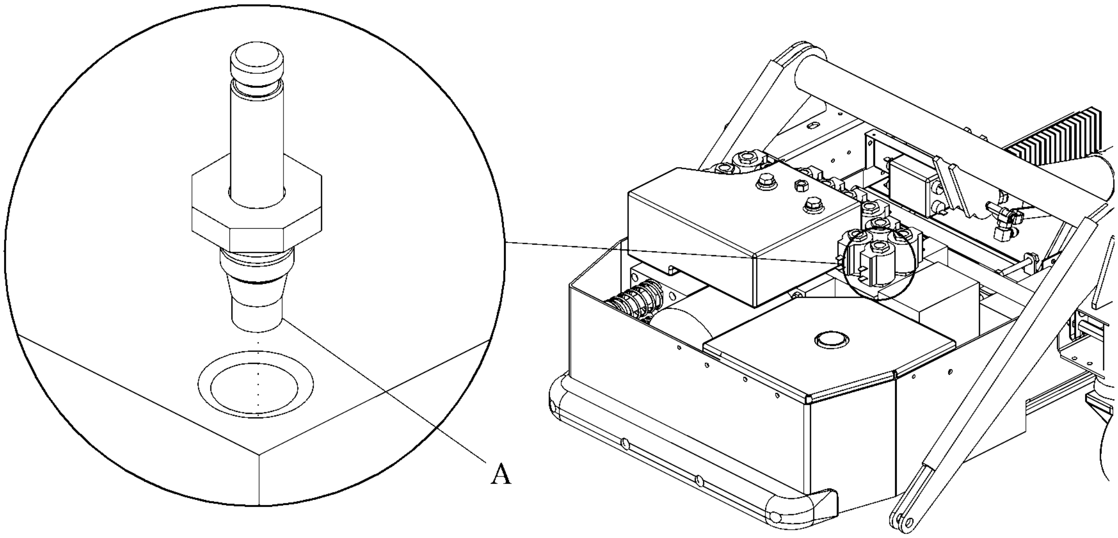
CAUTION:
Prior to removing hydraulic manifold valves, brace all applicable assemblies to prevent movement from the loss of hydraulic cylinder pressure.

6. Remove the hydraulic valve coil (refer to procedure 4.29).

CAUTION:
Do not damage the valve O-rings during removal of the hydraulic valve from the hydraulic manifold. Equipment damage can occur.

7. Using a 7/8" deep well socket wrench, remove the hydraulic valve (A) from the hydraulic manifold (see figure 4-34 on page 4-92). Use care not to damage the valve O-rings.

Figure 4-34. Hydraulic Actuation Valve



Replacement

CAUTION:
Ensure that the hydraulic oil is removed from the valve chamber before you install the hydraulic valve. Damage to the O-rings can occur if this is not done properly.

1. Using a basting syringe and flexible hose, remove the hydraulic oil from the valve chamber.
2. Ensure that the replacement valve (A) is the same type as the one removed.
3. Torque the hydraulic valve to 90 ± 10 in-lb (10.168 ± 1.12 N·m).
4. Complete the valve installation in reverse order of the removal steps.

4.31 Hydraulic Power Unit (P1900A and P1900B Models Only)

Tools required:
T25 Torx®[1] wrench
9/16" open end wrench
9/16" torque adapter
Large basting syringe
¼" Tygon®[2] flexible hose
Small Funnel
½" open end wrench
5/8" open end wrench
7/16" socket wrench
¾" open end wrench
½ gal container, clean
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 17.0 N·m)
Hilow cylinder brace (P/N SA1695)

Removal

WARNING:
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.

2. Using the **Bed Up** switch, raise the intermediate frame to the upper limit.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).

5. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

6. Install the hilow cylinder brace (refer to procedure 4.4).

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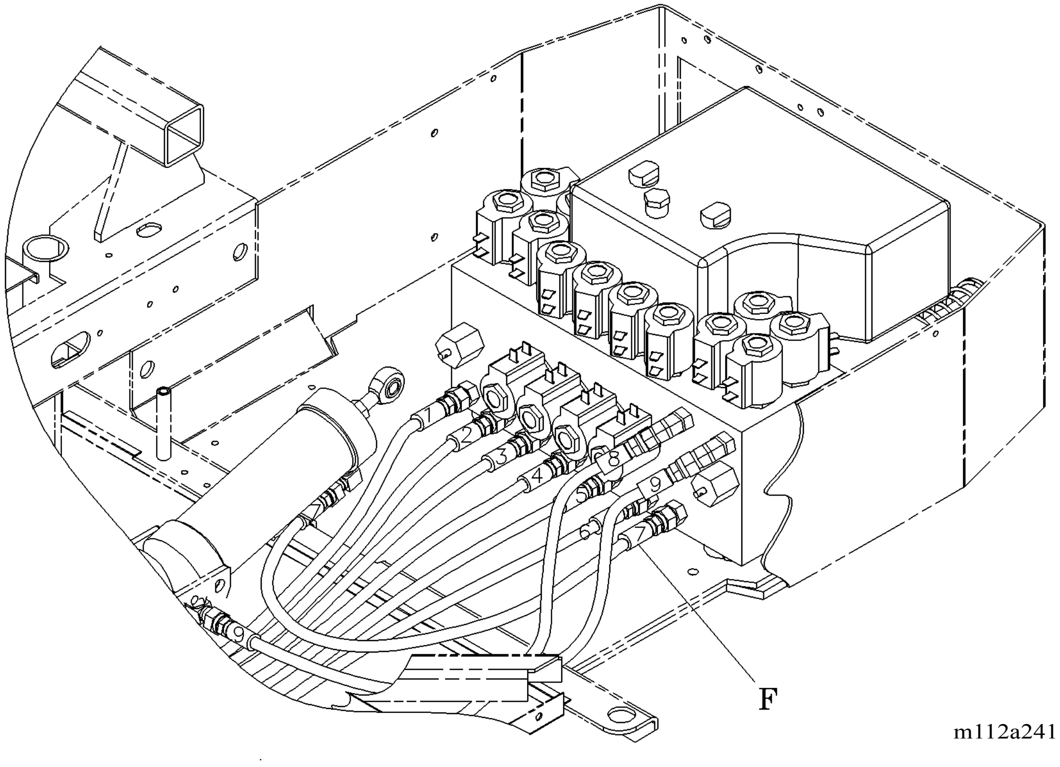
[1] Torx® is a registered trademark of Textron, Inc.
[2] Tygon® is a registered trademark of Norton Company.

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

7. Using a ½", 9/16", and 5/8" open end wrench, disconnect all of the nine hydraulic lines (F) from the manifold (see figure 4-35 on page 4-95).

Figure 4-35. Hydraulic Lines



8. Cap each hydraulic line (F) to prevent oil spills and seepage.

9. Disconnect the manual foot pump assembly from the hydraulic manifold (refer to procedure 4.31).

10. Disconnect and mark all electrical wiring from the hydraulic valve coils (refer to procedure 4.29).

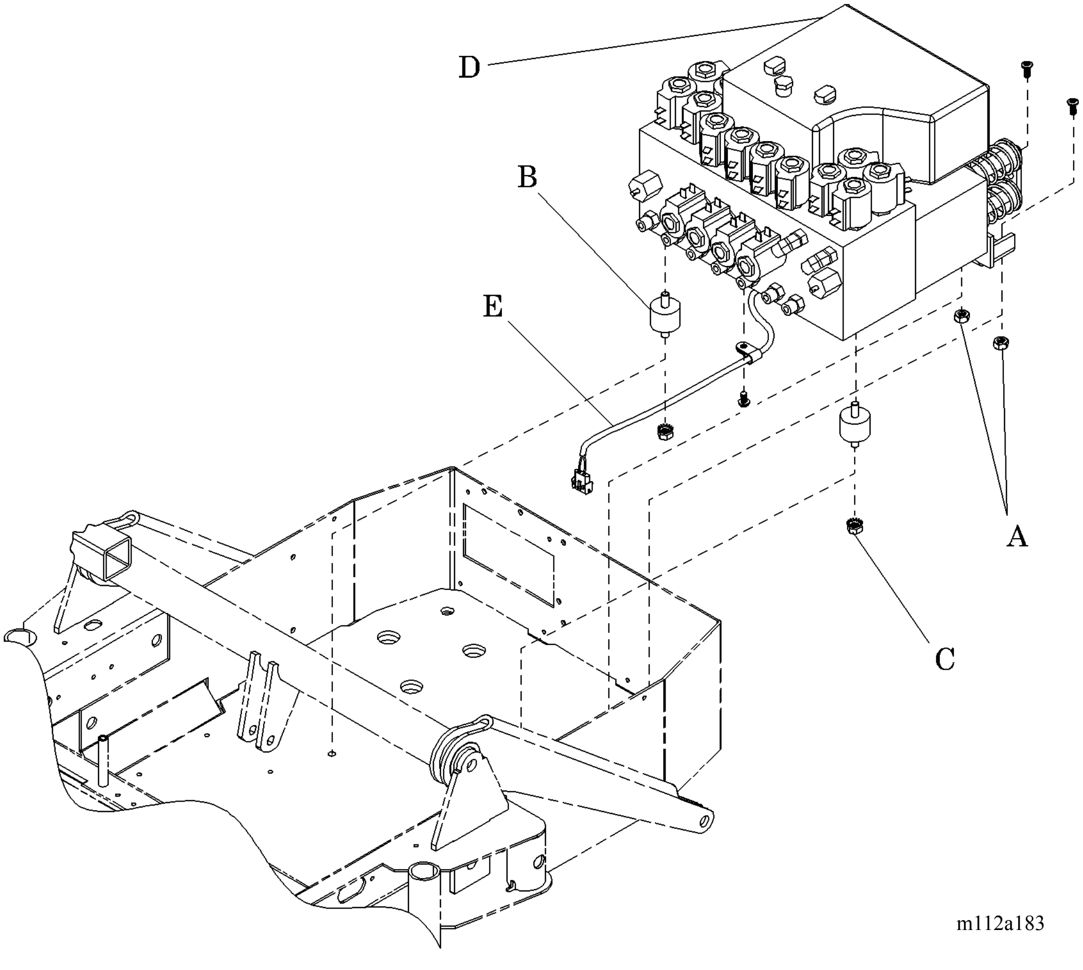
11. Disconnect the electrical cabling (E) from the hydraulic pump (D) (see figure 4-36 on page 4-96).

12. Remove the screw holding the bridge rectifier to the hydraulic pump (D), leaving the wires connected if possible.

NOTE:
They will need to be reinstalled on the new hydraulic pump if it is being replaced.

13. Disconnect the CPR and emergency Trendelenburg linkages by removing the hairpins.

Figure 4-36. Hydraulic Manifold and Pump



14. Using a 7/16" socket wrench, remove the four, hydraulic manifold, base frame, mounting nuts (A and C) from the bottom of the base frame.

15. If necessary, remove the isolation mount (B).

⚠ **WARNING:**
The hydraulic manifold assembly with pump weighs approximately 50 lb (23 kg). Use assistance, as necessary, to prevent personal injury or equipment damage.

16. Using caution and assistance, remove the manifold and pump (D) from the base frame.

Replacement

1. Ensure that all replacement parts are the same type as the ones removed.

2. Perform the removal procedure in reverse order.

3. Install the manual pump (refer to procedure 4.31), the CPR release valve (refer to procedure 4.39), and the Trendelenburg release valve (refer to procedure 4.42).

4. Using a ¾" open end wrench, adjust the pressure plate retaining nut to compress the pressure plates and return springs (D) by 1 9/16" ± 1/16" (39.7 mm ± 1.6 mm) (see figure 4.33 on page 4-103).

5. Tighten all hydraulic mounting bolt nuts (A and C) to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m) of torque.

6. Tighten all hydraulic lines (F) to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m) (see figure 4-35 on page 4-95) of torque.

7. Install the screw to reinstall the bridge rectifier onto the hydraulic pump.

8. Connect the CPR and emergency Trendelenburg linkages by reconnecting with the hairpins removed earlier.

9. Fill the reservoir (refer to procedure 4.28).

10. Remove the hilow cylinder brace (refer to procedure 4.4).

11. Bleed air from the hydraulic system as follows:
    a. Cycle the bed from the full up to the full down position four times.

  b. Articulate the bed from flat to chair for three times.

12. Verify that the bed does not drift downward when placed in the flat, full up position.
13. Install the base frame covers (refer to procedure 4.3).
14. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.32 Hydraulic Power Unit (P1900C and Newer Models Only)

Tools required:
Hilow cylinder brace (P/N SA1695)
Black marker
½" open end wrench
9/16" open end wrench
5/8" open end wrench
9/16" torque adapter
7/16" socket wrench
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)

Removal

WARNING:
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Using the **Bed Up** switch, raise the intermediate frame to the upper limit.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

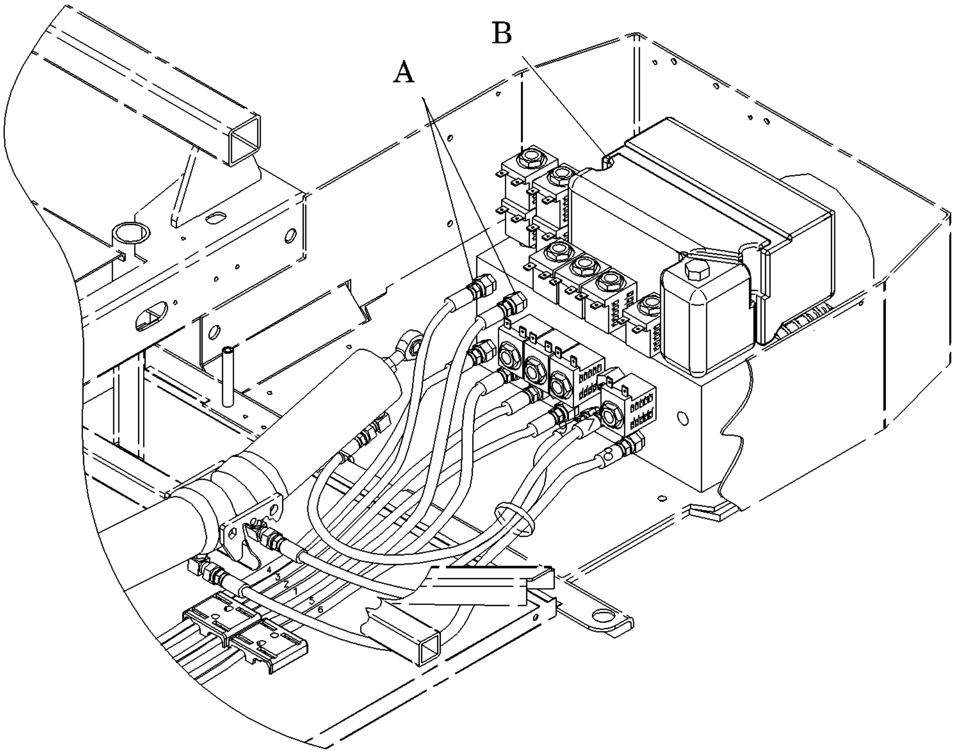
4. Disable the battery (refer to procedure 6.1).
5. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.
6. Install the hilow cylinder brace (refer to procedure 4.4).

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

7. Using a ½", 9/16", and 5/8" open end wrench, disconnect all nine hydraulic lines (A) from the hydraulic power unit (B) (see figure 4-37 on page 4-100).

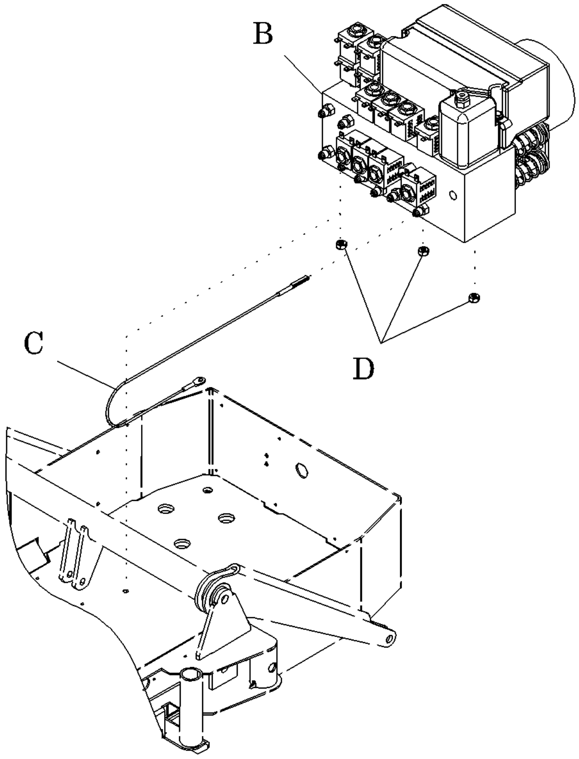
Figure 4-37. Hydraulic Lines



8. Cap each hydraulic line (A) to prevent oil spills and seepage.

9. Disconnect the foot pump cable assembly (C) from the hydraulic power unit (B) (see figure 4-38 on page 4-101).

Figure 4-38. Hydraulic Power Unit



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10. Disconnect all wires. Label on top of hydraulic reservoir (refer to procedure 4.29).

11. Remove the screw holding the bridge rectifier to the hydraulic power unit (B), leaving the wires connected if possible.

NOTE:
They will need to be reinstalled on the new hydraulic power unit if it is being replaced.

12. Disconnect the CPR and emergency Trendelenburg linkages by removing the hairpins.

13. Using a 7/16" socket wrench, remove the three locknuts (D) that secure the hydraulic power unit (B) to the bottom of the base frame.

WARNING:
The hydraulic manifold assembly with pump weighs approximately 50 lb (23 kg). Use assistance, as necessary, to prevent personal injury or equipment damage.

14. Using caution and assistance, remove the hydraulic power unit (B) from the base frame.

Replacement

1. Ensure that all replacement parts are the same type as the ones removed.
2. Perform the removal procedure in reverse order.
3. Using a 7/16" torque wrench, torque the three locknuts (D) to 60 in-lb ± 10 in-lb (6.8 N•m ± 1.12 N•m).
4. Using a 5/8" torque wrench, torque the hydraulic lines (A) to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m) (see figure 4-37 on page 4-100).
5. Install the screw to reinstall the bridge rectifier onto the hydraulic power unit.
6. Connect the CPR and emergency Trendelenburg linkages by reconnecting with the hairpins removed earlier.
7. Fill the reservoir (refer to procedure 4.28).
8. Remove the hilow cylinder brace (refer to procedure 4.4).
9. Bleed air from the hydraulic system as follows:
   a. Cycle the bed from the full up to the full down position for four complete cycles.
   b. Articulate the bed from the flat to the chair position for three complete cycles.
10. Verify that the bed does not drift downward when placed in the flat, full up position.
11. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.33 Hilow Foot Hydraulic Cylinder

Tools required:	2" x 4" safety block 4" needle nose pliers 5/8" open end wrench 5/8" open end torque wrench 7/16" socket wrench ½" open end wrench ¼" drift punch Ball peen hammer

Removal

WARNING:
Set the brakes, and install a 2" x 4" safety block between the base and the foot lift before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Place a 2" x 4" safety block between the base and the foot lift, and lower the bed to the low limit.

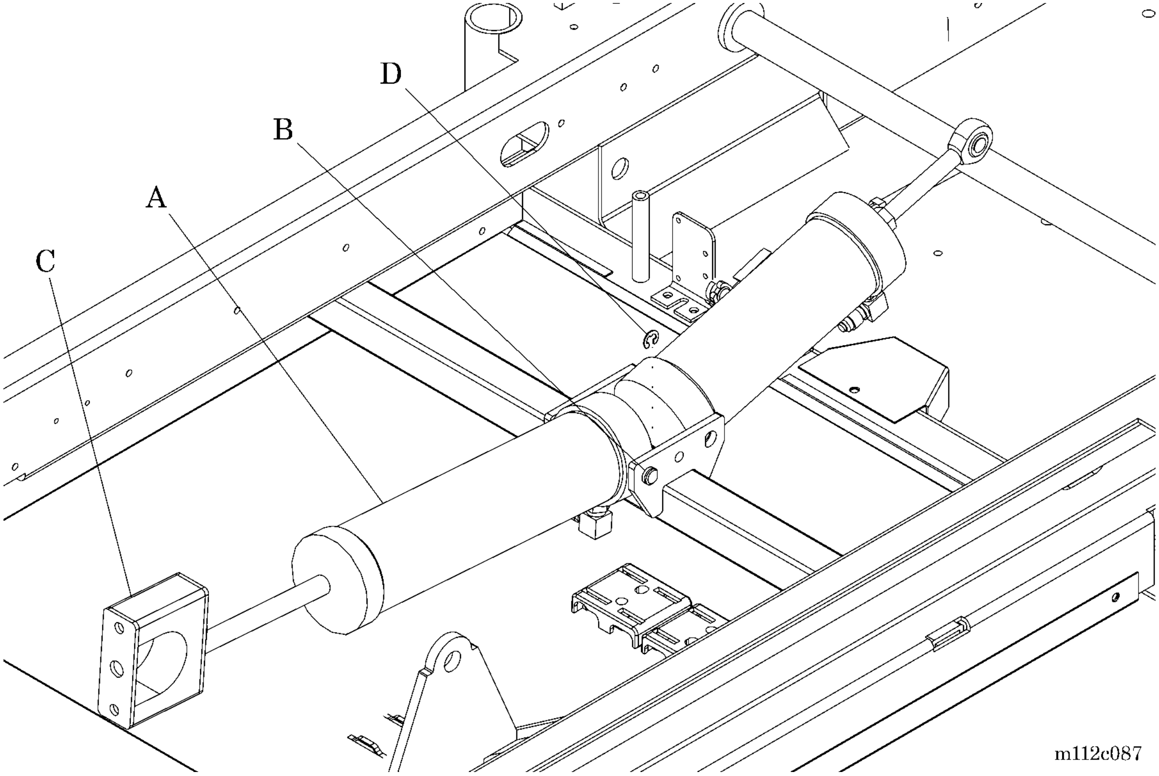
SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame to gain access to the hilow foot hydraulic cylinder (A) (see figure 4-39 on page 4-104).

Figure 4-39. Hilow Foot Hydraulic Cylinder



CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

6. Using the needle nose pliers, remove the E-clip (D) from the cylinder blank end pivot mounting shaft (B) of the hilow foot hydraulic cylinder (A).
7. Using a ball peen hammer and drift punch, lightly tap out the pivot mounting shaft (B) at the blank end of the hilow foot hydraulic cylinder (A).
8. Using a 7/16" socket wrench, remove the two nuts that secure the rod end clamp (C) to the frame foot end lift arm.
9. Separate, and remove the free half of the rod end clamp (C).

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

10. Using a 5/8" open end wrench and a ½" open end wrench, loosen the hydraulic hose from the hilow foot hydraulic cylinder (A).
11. Lift the hilow foot hydraulic cylinder (A) above the oil reservoir, and remove the hydraulic hose.
12. Cap the hose, or suspend it at a level above the reservoir oil level until the replacement hilow foot hydraulic cylinder (A) is ready for installation.

Replacement

1. Ensure that the hilow foot hydraulic cylinder (A) is the same type of cylinder as the one removed.
2. Using a 5/8" open end wrench and a ½" open end wrench, couple the hydraulic hose to the hilow foot hydraulic cylinder (A) fitting.
3. Using a ½" open end wrench and a 5/8" open end torque wrench, torque the hydraulic hose coupling to a torque of 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
4. Perform the removal procedure in reverse order.
5. Fill the reservoir (refer to procedure 4.28).
6. Plug the bed into an appropriate power source.
7. Raise the bed off of the safety block, and remove the 2" x 4" safety block.
8. Bleed air from the hydraulic system as follows:

   a. Cycle the bed from the full up to the full down position for four complete cycles.
   b. Articulate the bed from flat to chair for three complete cycles.

9. Verify that the bed does not drift downward when placed in the flat, full up position.

10. Install the base frame covers (refer to procedure 4.3).

11. Operate the hilow foot section to the full upper and lower limits. Check that the position sensors function properly.

12. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.34 Hilow Head Hydraulic Cylinder

Tools required:	2" x 4" safety block
	4" needle nose pliers
	5/8" open end wrench
	5/8" open end torque wrench
	½" open end wrench
	¼" drift punch
	Ball peen hammer

Removal

WARNING:
Set the brakes, and install a 2" x 4" safety block between the base and the foot lift before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Lower the bed to the low limit with the emergency Trendelenburg engaged (fully retracted). Raise the head end fully up.

2. Set the brakes.

3. Place a 2" x 4" safety block between the base and the foot lift.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

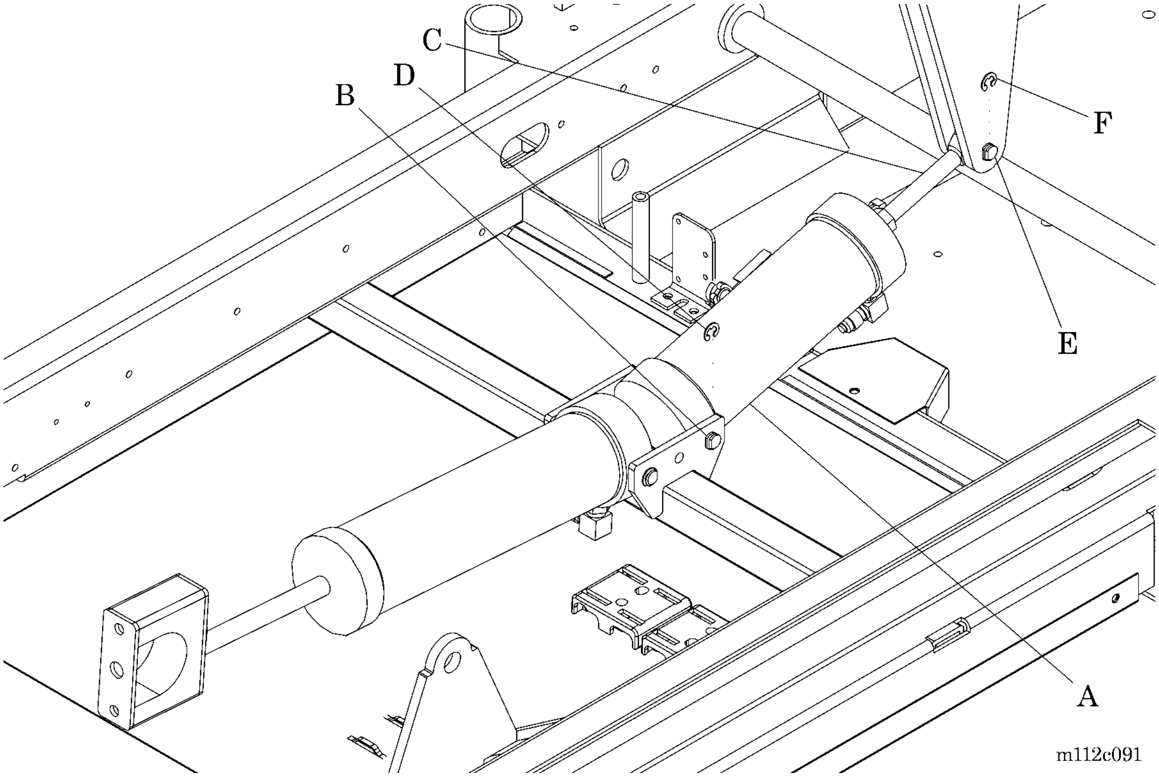
4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).

6. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.5) from the base frame to gain access to the hilow head hydraulic cylinder (A)(see figure 4-40 on page 4-108).

Figure 4-40. Hilow Head Hydraulic Cylinder



CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

7. Using the needle nose pliers, remove the E-clip (D) from the mounting shaft (B) at the blank end of the hilow head hydraulic cylinder (A).
8. Using a ball peen hammer and drift punch, lightly tap out the pivot shaft (C) at the base end of the hilow head hydraulic cylinder (A) cap.
9. Using a ball peen hammer and drift punch, lightly tap out the pivot mounting shaft (B) at the blind end of the hilow head hydraulic cylinder (A).

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

10. Using a 5/8" open end wrench and a ½" open end wrench, loosen the hydraulic hose from the hilow head hydraulic cylinder (A).

11. Remove the hydraulic hose and hilow head hydraulic cylinder (A).

12. Cap the hydraulic hose until the replacement hilow head hydraulic cylinder (A) is ready for installation.

Replacement

1. Using a 5/8" open end wrench and a ½" open end wrench, connect the hydraulic hose to the hilow head hydraulic cylinder (A) fitting.

2. Using a ½" open end wrench and a 5/8" open end torque wrench, torque the hydraulic hose coupling to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).

3. Perform the removal procedure in reverse order.

4. Fill the reservoir (refer to procedure 4.28).

5. Plug the bed into an appropriate power source.

6. Raise the bed off the 2" x 4" safety block, and remove the 2" x 4" safety block.

7. Bleed air from the hydraulic system as follows:
   a. Cycle the bed from the full up to the full down position for four complete cycles.
   b. Articulate the bed from flat to chair for three complete cycles.

8. Verify that the bed does not drift downward when placed in the flat, full up position.
9. Install the base frame covers (refer to procedure 4.3).
10. Operate the hilow head section to the bed’s full upper and lower limits. Check that the position sensors function properly.
11. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.35 Head Hydraulic Cylinder

Tools required: Hilow cylinder brace (P/N SA1695)
5/8" open end wrench
5/8" open end torque wrench
9/16" open end wrench
4" needle nose pliers
¼" drift punch
Ball peen hammer
2" x 4" safety block (2)
9/16" open end torque wrench

Removal

1. Raise the bed to the maximum height.
2. Place 2" x 4" safety blocks under each end of the upper frame.
3. Ensure that the head section is flat.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).
6. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

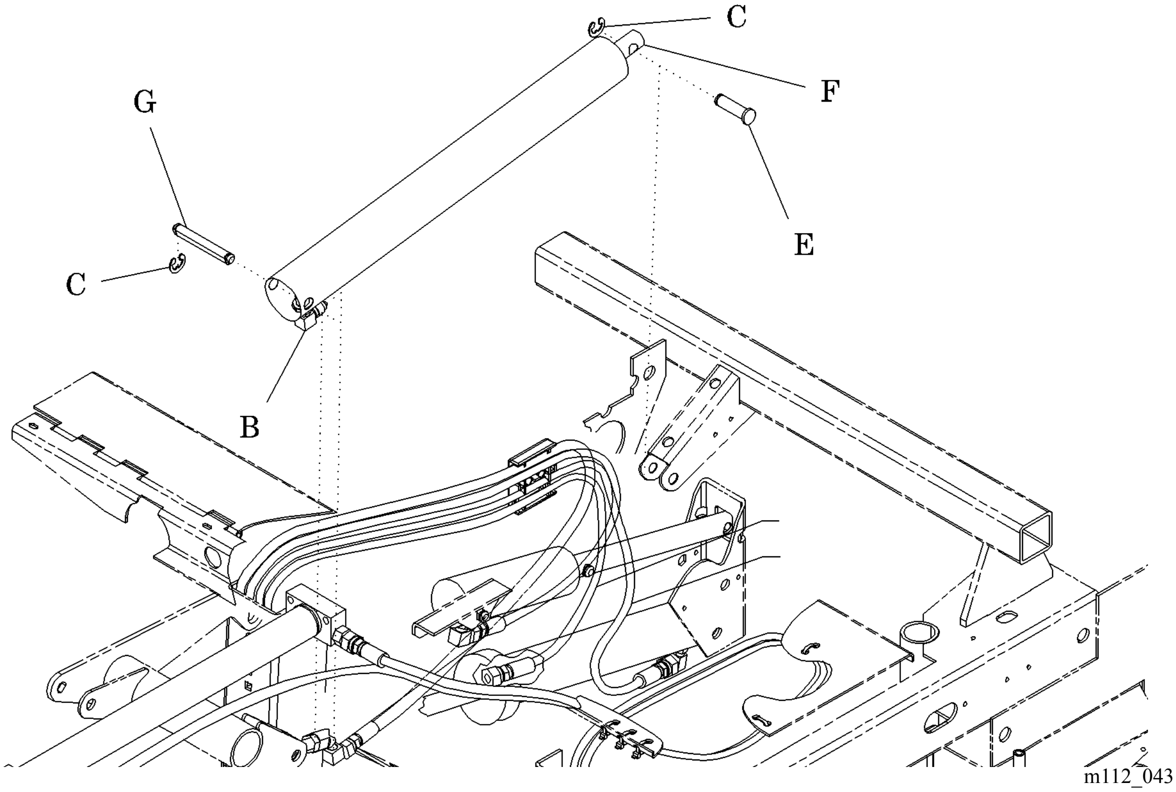
WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

7. Install the hilow cylinder braces (refer to procedure 4.4).

CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

8. Using a needle nose pliers, remove the E-clips (C) from the clevis pin (E) and D-pin (G) (see figure 4-41 on page 4-112).

Figure 4-41. Head Hydraulic Cylinder



9. Using a ball peen hammer and drift punch, lightly tap out the clevis pin (E) located at the end of the cylinder push rod (F).
10. Using a ball peen hammer and drift punch, lightly tap out the D-pin (G) located at the end of the base end of the cylinder cap.

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

11. Using a 5/8" open end wrench and a 9/16" open end wrench, loosen the hydraulic hose from the cylinder fitting (B).

12. Remove the hydraulic hose and head hydraulic cylinder.

13. Cap the hose until the replacement head hydraulic cylinder is ready for installation.

Replacement

1. Using a 5/8" open end wrench and a 9/16" open end wrench, couple the hydraulic hose to the cylinder fitting (F).

2. Using a 5/8" open end wrench and a 9/16" open end torque wrench, torque the hose fitting to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).

3. Perform the removal procedure in reverse order.

4. Fill the reservoir (refer to procedure 4.28).

5. Remove the hilow cylinder brace (refer to procedure 4.4).

6. Plug the bed into an appropriate power source.

7. Bleed air from the hydraulic system as follows:
   a. Cycle the bed from the full up to the full down position for four complete cycles.
   b. Articulate the bed from flat to chair for three complete cycles.

8. Verify that the bed does not drift downward when placed in the flat, full up position.

9. Install the base frame covers (refer to procedure 4.3).
10. Operate the head section to the full upper and lower limits. Check that the position sensors function properly.
11. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.36 Knee Hydraulic Cylinder

Tools required: Hilow cylinder brace (P/N SA1695)
5/8" open end wrench
5/8" open end torque adapter
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)
½" open end wrench
4" needle nose pliers
¼" drift punch
Ball peen hammer
2" x 4" safety block (3)

Removal

1. Set the brakes.
2. Raise the bed to the maximum height.
3. Place 2" x 4" safety blocks under each end of the upper frame.
4. Raise the head section to its upper limit, and install a 2" x 4" safety block.
5. Press the **Knee Down** control for 2 s.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

6. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

7. Disable the battery (refer to procedure 6.1).
8. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

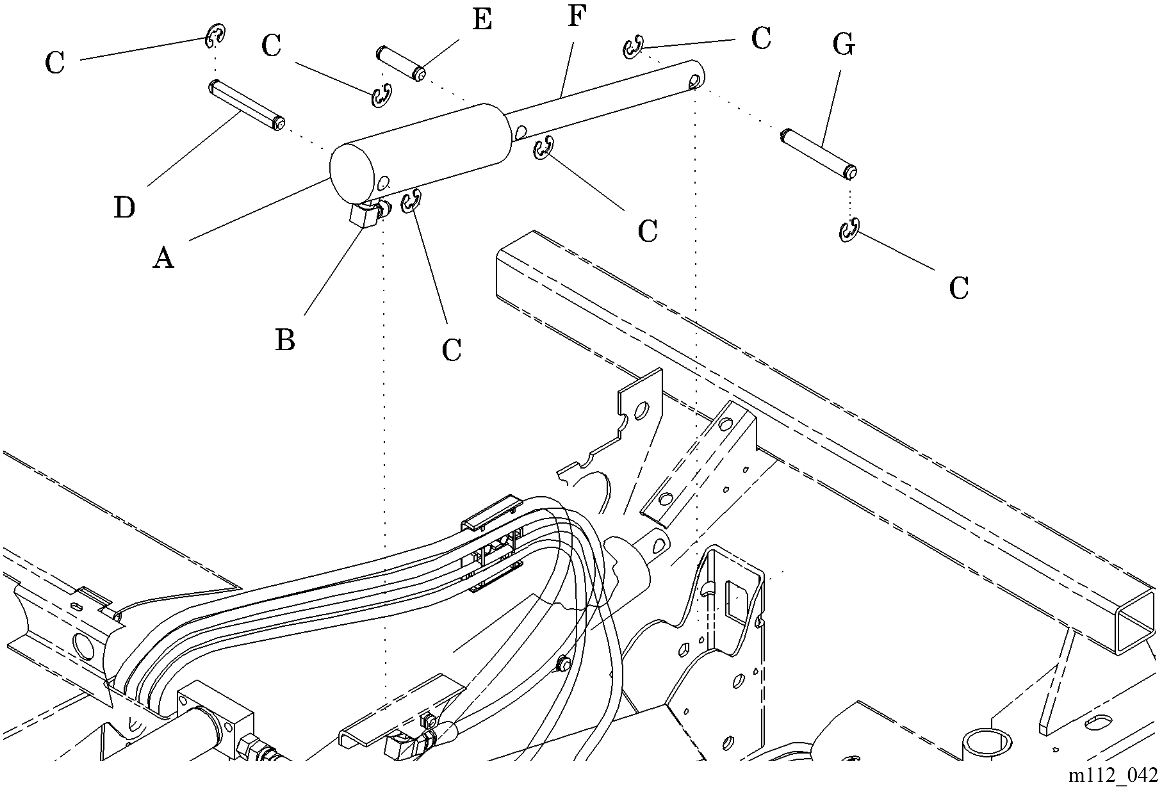
WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

9. Install the hilow cylinder brace (refer to procedure 4.4).

CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

10. Using the needle nose pliers, remove one E-clip (C) from the clevis pin (E) (see figure 4-42 on page 4-116).

Figure 4-42. Knee Hydraulic Cylinder



11. Using the needle nose pliers, remove one E-clip (C) from each remaining D-pin (D and G).

12. Pull out the D-pin (G) located at the end of the cylinder push rod (F).

13. Using a ball peen hammer and drift punch, lightly tap out the D-pin (D) located at the base end of the cylinder (A).

⚠ **WARNING:**
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

⚠ **WARNING:**
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

14. Using a 5/8" open end wrench and a ½" open end wrench, loosen the hydraulic hose (B) from the cylinder (A).
15. Remove the hydraulic hose (B).
16. Cap the hydraulic hose (B) until the replacement cylinder (A) is ready for installation.

Replacement

1. Using a 5/8" open end wrench and a 1/2" open end wrench, connect the hydraulic hose (B) to the cylinder (A) fitting.
2. Using a ½" open end wrench and a 5/8" open end torque wrench, torque the hydraulic hose fitting to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
3. Perform the removal procedure in reverse order.
4. Fill the reservoir (refer to procedure 4.28).
5. Remove the hilow cylinder brace (refer to procedure 4.4).
6. Plug the bed into an appropriate power source.
7. Using the **Head Up** control, extend the head cylinder.
8. Remove the 2" x 4" safety blocks from the head section.
9. Bleed air from the hydraulic system as follows:
    a. Cycle the bed from the full up to the full down position for four complete cycles.

   b. Articulate the bed from flat to chair for three complete cycles.

10. Verify that the bed does not drift downward when placed in the flat, full up position.

11. Install the base frame covers (refer to procedure 4.3).

12. Cycle the knee section through the full upper and lower limits four times. Check that both position sensors function properly

13. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.37 Retracting Foot Hydraulic Cylinder

Tools required:
Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
5/8" open end wrench
5/8" open end torque adapter
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)
½" open end wrench
7/16" socket wrench
2" x 4" safety block (2)

Removal

1. Set the brakes.
2. Raise the bed to the maximum height. Place 2" x 4" safety blocks under each end of the upper frame.
3. Extend the foot end 1" to 2" (3 cm to 5 cm).
4. Place the bed into the flat position.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).
7. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

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[1] Torx® is a registered trademark of Textron, Inc.

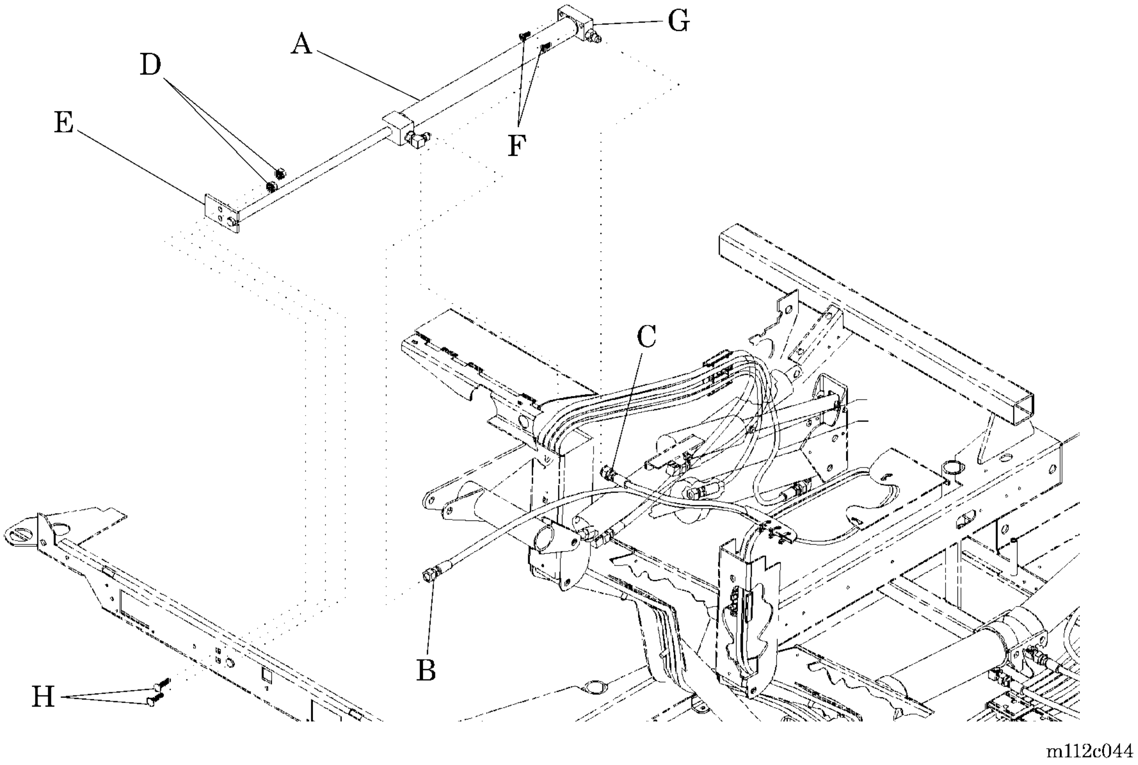
WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

8. Install the hilow cylinder brace (refer to procedure 4.4).

CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

9. Using a 7/16" socket wrench, remove the two nuts (D) and bolts (H) from the push rod mounting plate (E) (see figure 4-43 on page 4-120).

Figure 4-43. Retracting Foot Hydraulic Cylinder



10. Using a T25 Torx®[1] wrench, remove the two bolts (F) that secure the foot retracting hydraulic cylinder (A) to the frame.

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[1] Torx® is a registered trademark of Textron, Inc.

⚠ **WARNING:**
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

⚠ **WARNING:**
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

11. Using a 5/8" open end wrench and a ½" open end wrench, loosen and remove the two hydraulic hoses (B and C) from the cylinder fittings (G).

12. Cap the two hydraulic hoses (B and C) until the replacement foot retracting hydraulic cylinder (A) is ready for installation.

Replacement

1. Using a 5/8" open end wrench and a ½" open end wrench, connect the hydraulic hoses (B and C) to the cylinder fittings (G).

2. Using a ½" open end wrench and a 5/8" open end torque wrench, torque both hydraulic hose fittings (B and C) to a torque of 90 ± 10 in-lb (10.2 ± 1.1 N·m).

⚠ **CAUTION:**
The bolts can pierce any of the three position sensor cables if they have shifted during replacement. Use caution when installing these bolts. Damage to equipment can occur.

3. Perform the removal procedure in reverse order.

4. Fill the reservoir (refer to procedure 4.28).

5. Remove the hilow cylinder brace (refer to procedure 4.4).

6. Plug the bed into an appropriate power source.

7. Verify that the bed does not drift downward when placed in the flat, full up position.

8. Install the base frame covers (refer to procedure 4.3).
9. Operate the foot section to the full extended and retracted limits for four complete cycles. Check that both position sensors function properly.
10. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

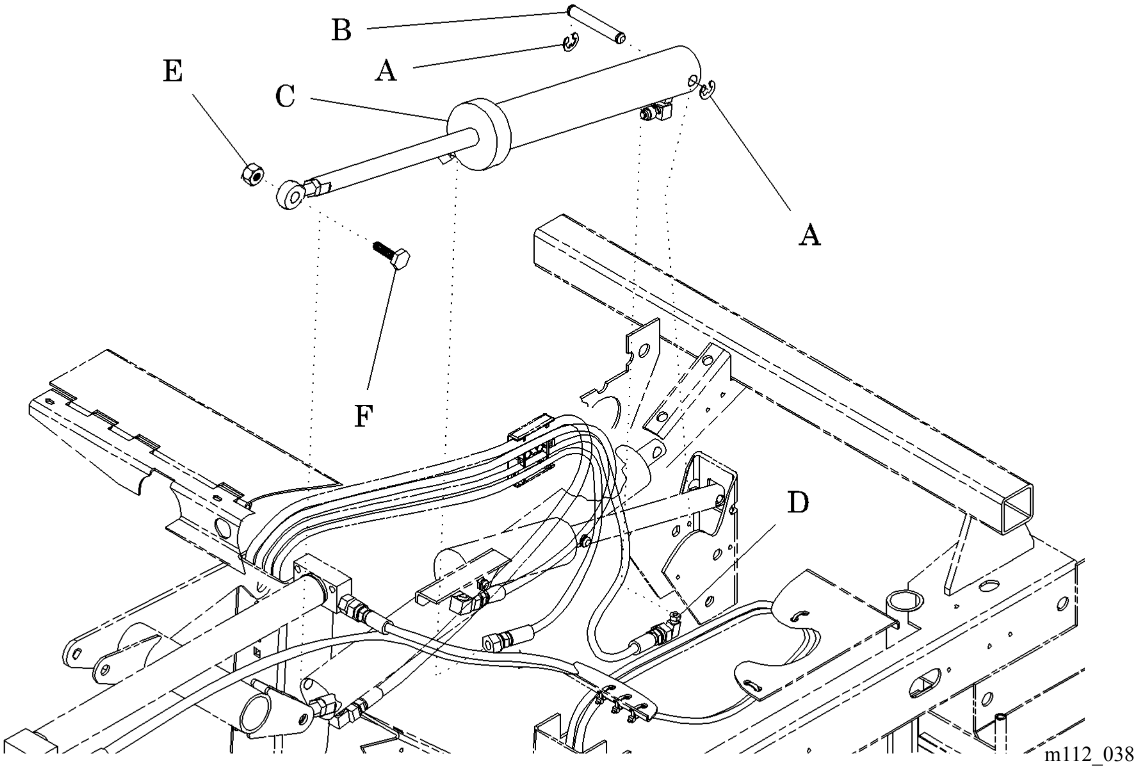
4.38 Articulating Foot Hydraulic Cylinder

Tools required:	Hilow cylinder brace (P/N SA1695)	
	5/8" open end wrench	2" x 4" safety brace
	9/16" open end wrench	9/16" socket wrench
	5/8" open end torque adapter	½" open end wrench
	4" needle nose pliers	¼" drift punch
	Ball peen hammer	
	Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)	

Removal

1. Set the brakes.
2. Press the head siderail **Bed Up** switch to raise the bed.
3. Position the bed at a height that provides easy access to the foot articulation cylinder (C) (see figure 4-44 on page 4-123).

Figure 4-44. Articulating Foot Hydraulic Cylinder Removal



4. Place a 2" x 4" safety block under the articulated foot frame.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).

7. Remove the tub base, top center (refer to procedure 4.3), and foot end base covers (refer to procedure 4.6) from the base frame.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

8. Install the hilow cylinder braces (refer to procedure 4.4).

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

WARNING:
The hydraulic lines may contain pressure. Disconnect the lines slowly to prevent rapid escape of hydraulic fluid. Personal injury may occur.

CAUTION:
Loosening or removing of any hydraulic cylinder hose will cause loss of hydraulic pressure within that system. Install all braces and supports prior to beginning work on any component of the hydraulic system.

9. Using a 9/16" open end wrench and 9/16" socket wrench, remove the nut (E) and bolt (F) from the push rod of the foot articulation cylinder (C).
10. Using needle nose pliers, remove the E-clips (A) from the D-pin (B).
11. Using a ball peen hammer and drift punch, lightly tap out the D-pin (B) located at the base end of the foot articulation cylinder (C).
12. Using a 5/8" open end wrench and a ½" open end wrench, loosen and remove the hydraulic hoses (D) from the foot articulation cylinder (C).
13. Remove the foot articulation cylinder (C).
14. Cap the hydraulic hoses (D) until the replacement foot articulation cylinder (C) is ready for installation.

Replacement

1. Using a ½" open end wrench and a 5/8" open end wrench, connect the hydraulic hoses (D) to the foot articulation cylinder (C) fittings.
2. Using a ½" open end wrench and a 5/8" open end torque wrench, torque the hydraulic hose (D) fittings to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
3. Perform the removal procedure in reverse order.

4. Fill the reservoir (refer to procedure 4.28).
5. Remove the hilow cylinder brace (refer to procedure 4.4).
6. Plug the bed into an appropriate power source.
7. Verify that the bed does not drift downward when placed in the flat, full up position.
8. Install the base frame covers (refer to procedure 4.3).
9. Operate the articulating foot section to the full upper and lower limits. Check that the position sensors function properly.
10. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.39 CPR Release Valve

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
7/8" deep well socket
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)
7/16" open end wrench
Large basting syringe
¼" flexible Tygon®[2] hose
Towels

Removal

1. Place the bed in the flat, raised position.
2. Using the foot brake, lock all of the wheel casters.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).
4. Ensure that the head and knee sections are flat.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).
7. Using a T25 Torx® wrench, remove the base frame head and tub covers (refer to procedure 4.3).

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[1] Torx® is a registered trademark of Textron, Inc.

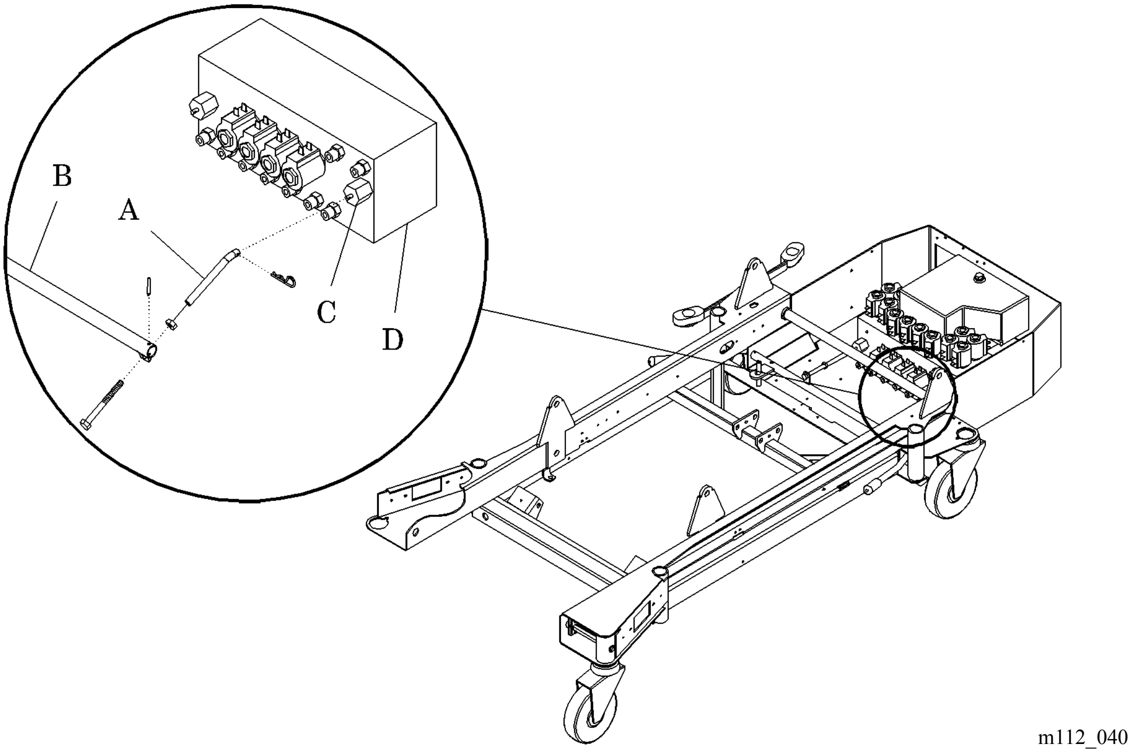
[2] Tygon® is a registered trademark of Norton Company.

WARNING:
Hydraulic fluid can be an irritant. Do not ingest, and keep away from eyes and mouth. Where eye protection and gloves when pouring or handling. Failure to wash hands or clothing after contact can cause personal injury. For more information about this product, refer to its MSDS.

8. Using a basting syringe and flexible Tygon®[1] hose, remove the hydraulic oil from the oil reservoir.

9. Using a 7/16" open end wrench, disconnect and remove the mechanical emergency Trendelenburg valve linkage (A) from between the emergency Trendelenburg actuator (B) and CPR release valve (C) (see figure 4-45 on page 4-128).

Figure 4-45. CPR Release Valve



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[1] Tygon® is a registered trademark of Norton Company.

CAUTION:
Use care not to damage the CPR release valve O-rings. Failure to do so can result in damage to equipment.

10. Using a 7/8" deep-well socket wrench, remove the valve core (A) and CPR release valve (C) from the hydraulic manifold (D) (refer to procedure 4.30).

Replacement

1. Manually insert the CPR release valve (C), and tighten it by hand until it is snug.
2. Using a 7/8" deep-well socket and torque wrench, tighten and torque the CPR release valve (C) to 90 in-lb (10.2 N•m).
3. Using a 7/16" open end wrench, connect the mechanical CPR valve linkage (A) between the CPR actuator (B) and CPR release valve (C).
4. Depress the emergency Trendelenburg foot lever to the mechanical stop, and adjust the emergency Trendelenburg valve linkage (A) until the CPR release valve (C) releases the hydraulic pressure, allowing the bed to begin moving downward against the bracing.
5. Add hydraulic oil to the reservoir as needed (refer to procedure 4.28). Observe the fill lines on the side of the reservoir.
6. Release the CPR actuator (B), and verify that the lower CPR sensor switch makes electrical contact just prior to the opening of the CPR release valve (C).
7. Plug the bed into an appropriate power source.
8. Bleed air from the hydraulic system as follows:
   a. Cycle the bed from the full up to the full down position for four complete cycles.
   b. Articulate the bed from flat to chair for three complete cycles.
9. Verify that the bed does not drift downward when placed in the flat, full up position.
10. Install the base frame covers (refer to procedure 4.3).

11. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.40 CPR Sensor

Tools required:	Hilow cylinder brace (P/N SA1695) T15 Torx®[1] wrench ¼" open end wrench 4" needle nose pliers T25 Torx® wrench

Removal

1. Place the bed in the flat, raised position.
2. Using the foot brake, lock all of the wheel casters.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder braces (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).
6. Using a T25 Torx® wrench, remove the base frame head and tub covers (refer to procedure 4.3).
7. Using the needle nose pliers, remove the spade-connected CPR sense wires (B) from the lower CPR switch assembly (A) (see figure 4-46 on page 4-132).

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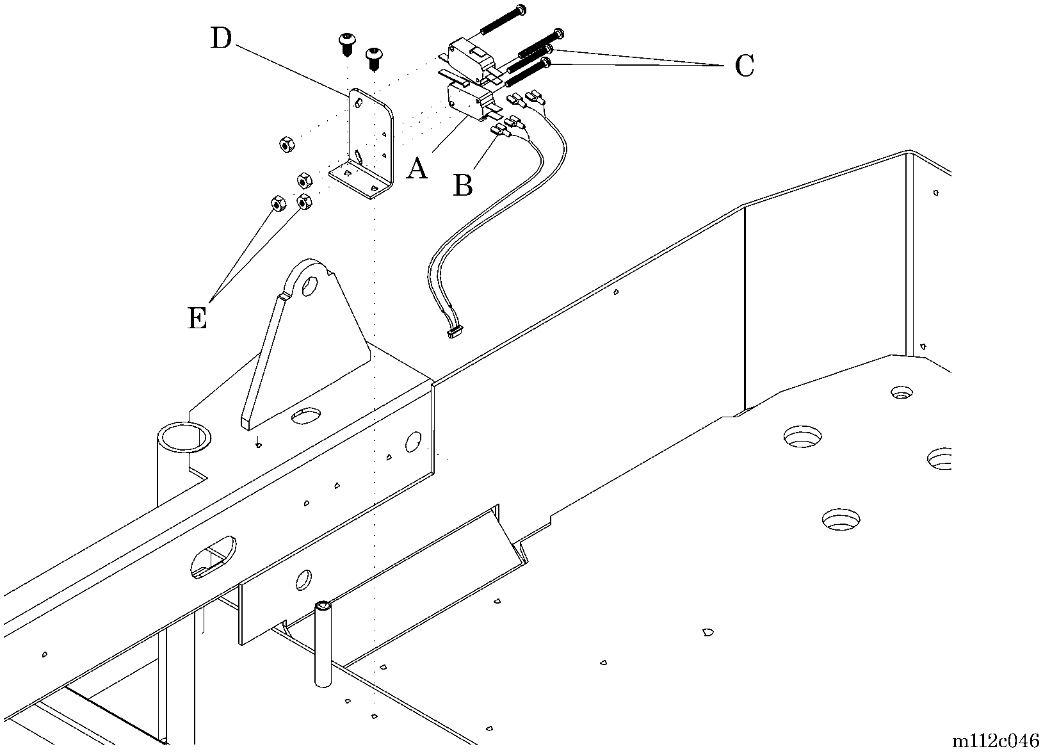
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-46. CPR Sensor Switch



8. Using a T15 Torx®[1] wrench and a ¼" open end wrench, remove the two switch mounting bolts (C) and nuts (E) securing the CPR switch assembly (A) to the CPR/Trendelenburg switch bracket (D).

9. Remove the CPR switch assembly (A) from the CPR/Trendelenburg switch bracket (D).

Replacement

1. Perform the removal procedure in reverse order.

2. Depress the CPR foot lever to the mechanical stop, and adjust the CPR switch assembly (A) until it makes electrical contact just prior to the actuation of the CPR release valve.

3. Using a T15 Torx® wrench and ¼" open end wrench, install the two switch mounting bolts (C) and nuts (E) to secure the CPR switch assembly (A) to the CPR/Trendelenburg switch bracket (D).

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[1] Torx® is a registered trademark of Textron, Inc.

4. Using the CPR foot pedal, verify that the CPR/Trendelenburg functions operate properly.
5. Install the base frame covers (refer to procedure 4.3).
6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.41 Trendelenburg Sensor

Tools required:
Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
T15 Torx® wrench
¼" open end wrench
4" needle nose pliers

Removal

1. Place the bed in the flat, raised position.
2. Using the foot brake, lock all of the wheel casters.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder braces (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).
6. Using a T25 Torx® wrench, remove the base frame head and tub covers (refer to procedure 4.3).
7. Using the needle nose pliers, remove the spade-connected Trendelenburg sense wires (B) from the upper Trendelenburg switch assembly (A) (see figure 4-47 on page 4-135).

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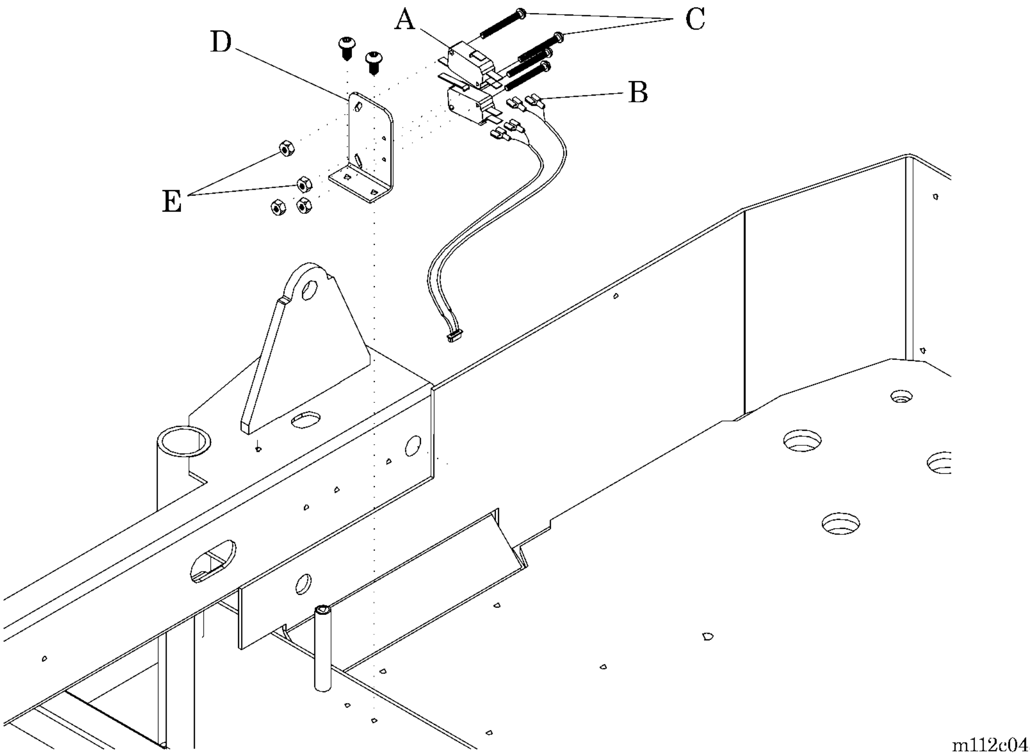
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-47. Trendelenburg Sensor Switch



8. Using a T15 Torx®[1] wrench and a ¼" open end wrench, remove the two switch mounting bolts (C) and nuts (E) securing the Trendelenburg switch assembly (A) to the CPR/Trendelenburg switch bracket (D).

9. Remove the Trendelenburg switch assembly (A) from the CPR/ Trendelenburg switch bracket (D).

Replacement

1. Perform the removal procedure in reverse order.

2. Raise the Trendelenburg foot lever to the mechanical stop, and adjust the Trendelenburg switch assembly (A) until it makes electrical contact just prior to the actuation of the Trendelenburg release valve.

3. Using a T15 Torx® wrench and ¼" open end wrench, tighten the two switch mounting bolts (C) and nuts (E) to secure the Trendelenburg switch assembly (A) to the CPR/Trendelenburg switch bracket (D).

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[1] Torx® is a registered trademark of Textron, Inc.

4. Using the Trendelenburg foot pedal, verify that the CPR/Trendelenburg functions operate properly.
5. Install the base frame covers (refer to procedure 4.3).
6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.42 Emergency Trendelenburg Release Valve

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
7/8" deep socket wrench
9/16" open end wrench
Large basting syringe
¼" flexible Tygon®[2] hose
½ gal container, clean
Towels

Removal

WARNING:
Set the brakes, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Place the bed in the flat, raised position.
2. Using the foot brake, lock all of the wheel casters.
3. Install the hilow cylinder braces (refer to procedure 4.4).
4. Ensure that the head and knee sections are flat.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).
7. Remove the base frame head, and tub covers (refer to procedure 4.3).

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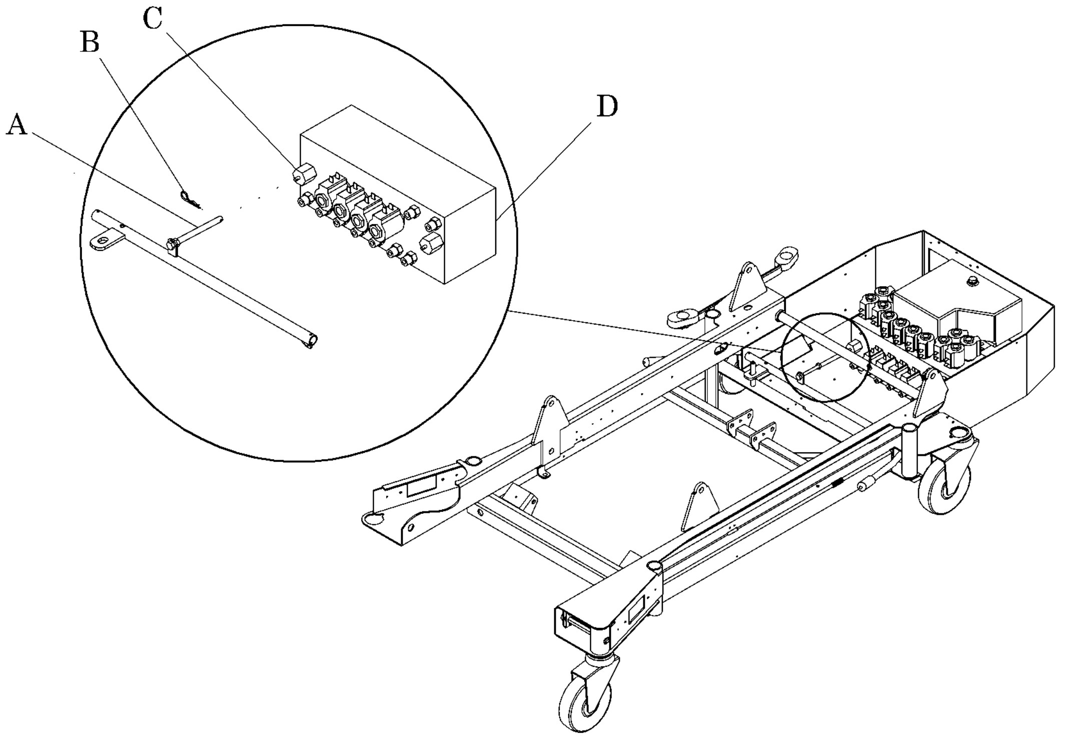
[1] Torx® is a registered trademark of Textron, Inc.
[2] Tygon® is a registered trademark of Norton Company.

8. Using a basting syringe and flexible Tygon®[1] hose, remove the hydraulic oil from the oil reservoir.

9. Remove the mechanical Trendelenburg valve linkage from between the Trendelenburg actuator and Trendelenburg release valve (C) (see figure 4-48 on page 4-138).

Figure 4-48. Trendelenburg Release Valve



CAUTION:
Use care not to damage the valve O-rings. Failure to do so can result in damage to equipment.

10. Using a 7/8" deep-well socket wrench, remove the valve core (A) and Trendelenburg release valve (C) from the hydraulic manifold (D) (refer to procedure 4.30).

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[1] Tygon® is a registered trademark of Norton Company.

Replacement

1. Manually insert the Trendelenburg release valve (C) into the hydraulic manifold (D), and tighten it by hand until it is snug.
2. Using a 7/8" deep-well socket and torque wrench, tighten and torque the Trendelenburg release valve (C) to 90 in-lb (10.168 N•m).
3. Connect the mechanical Trendelenburg valve linkage between the Trendelenburg actuator and Trendelenburg release valve (C).
4. Add hydraulic oil to the reservoir as needed (refer to procedure 4.28). Observe the level lines indicated on the side of the reservoir.
5. Release the Trendelenburg actuator, and verify that the upper Trendelenburg sensor switch makes electrical contact just prior to the opening of the Trendelenburg release valve (C).
6. Plug the bed into an appropriate power source.
7. Bleed air from the hydraulic system.
    a. Cycle the bed from the full up to the full down position for four complete cycles.
    b. Articulate the bed from flat to chair for three complete cycles.
8. Verify that the bed does not drift downward when placed in the flat, full up position.
9. Install the base frame covers (refer to procedure 4.3).
10. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.43 Position Sensor

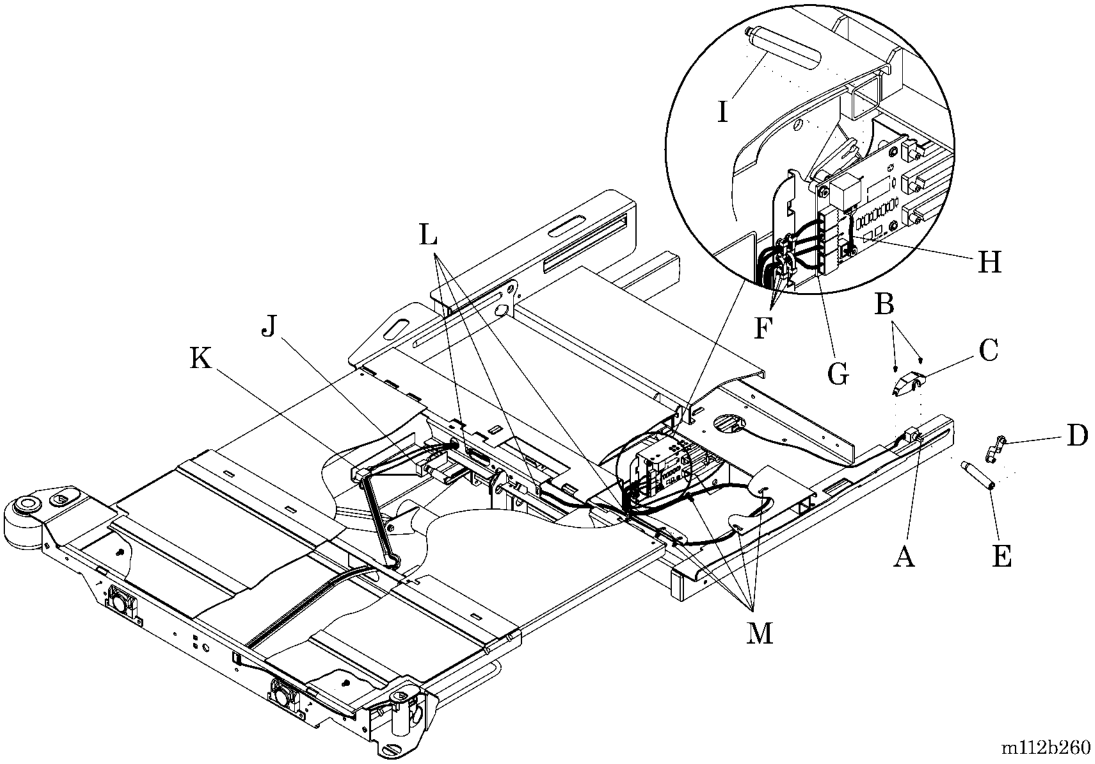
Tools required:	Hilow cylinder brace (P/N SA1695) T25 Torx®[1] wrench Side cutters Adhesive remover

NOTE:
Perform this procedure for the head position sensor, knee position sensor, foot articulation position sensor, and foot retraction position sensor. For the hilow position sensor, refer to “Hilow Position Sensor” on page 4-143.

Removal

1. Set the brakes.
2. Using the Point-of-Care® Siderail Controls, raise the bed to a height that provides easy access to the weigh frame junction electrical box (G) (see figure 4-49 on page 4-140).

Figure 4-49. Position Sensor



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1. Torx® is a registered trademark of Textron, Inc.

3. Extend the articulating deck.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

4. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).
7. To remove the head position sensor and cable assembly (A), perform the following:
    a. Using a T25 Torx®[1] wrench, remove the two Torx® button head screws (B) that secure the head sensor cover (C) to the weigh frame.
    b. Using adhesive remover, remove the adhesive that secures the head sensor short link (D) and the head sensor long link (E) to the head position sensor and cable assembly (A).
    c. Remove the head sensor short link (D) and the head sensor long link (E) from the head position sensor and cable assembly (A)
    d. Using side cutters, remove the two small cable ties (F) that secure the head position sensor and cable assembly (A) to the weigh frame junction electrical box (G).
    e. Disconnect the head position sensor and cable assembly (A) from the weigh frame junction electrical box (G).
    f. Remove the head position sensor and cable assembly (A) from the weigh frame.

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8. To remove the knee position sensor and cable assembly (H), perform the following:
   a. Remove the knee position sensor link (I) from the knee position sensor and cable assembly (H).
   b. Disconnect the knee position sensor and cable assembly (H) from the weigh frame junction electrical box (G).
   c. Remove the knee position sensor and cable assembly (H) from the weigh frame junction electrical box (G).

9. To remove the foot articulation position sensor and cable assembly (J) or foot retraction position sensor and cable assembly (K), perform the following:
   a. Using side cutters, remove the three small cable ties (L) and five large cable ties (M) that secure the foot articulation position sensor and cable assembly (J) and foot retraction position sensor and cable assembly (K) to the weigh frame.
   b. Using side cutters, remove the two small cable ties (F) that secure the foot articulation position sensor and cable assembly (J) and foot retraction position sensor and cable assembly (K) to the weigh frame junction electrical box (G).
   c. Disconnect the foot articulation position sensor and cable assembly (J) or foot retraction position sensor and cable assembly (K) from the weigh frame junction electrical box (G).
   d. Remove the foot articulation position sensor and cable assembly (J) or foot retraction position sensor and cable assembly (K) from the weigh frame.

Replacement

1. Perform the removal procedure in reverse order.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.44 Hilow Position Sensor

Tools required: Hilow cylinder brace (P/N SA1695)
Side cutters

Removal

1. Set the brakes.

2. Using the Point-of-Care® Siderail Controls, raise the bed to the high position.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).

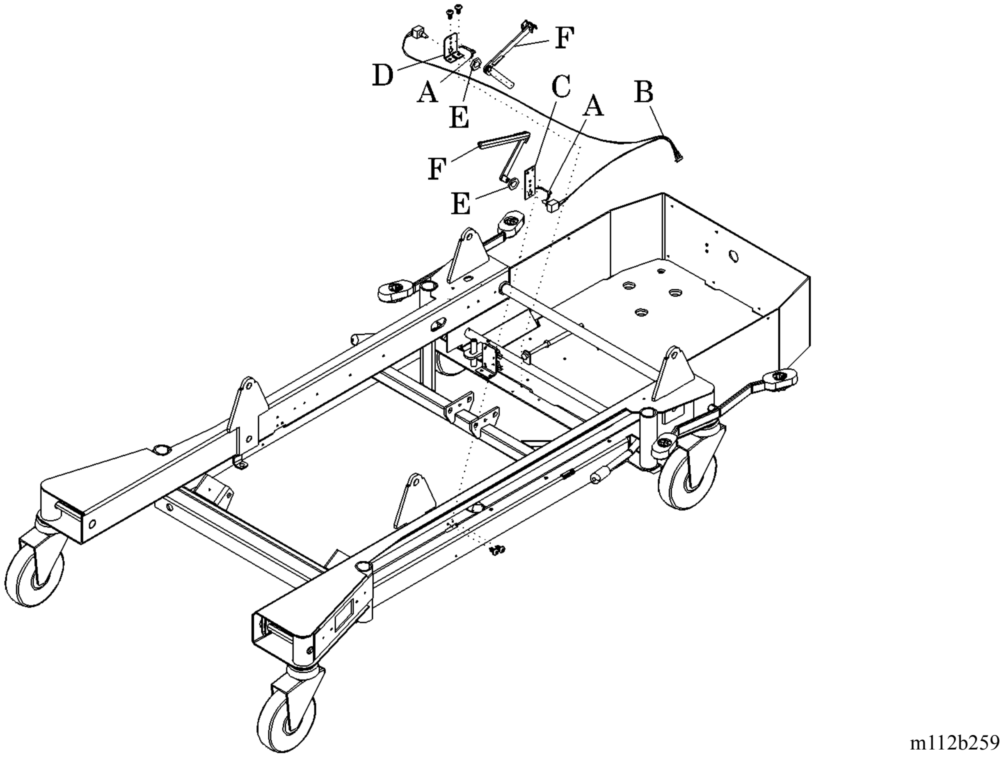
6. Remove the tub base cover and top center base cover (refer to procedure 4.3).

7. Remove the foot end caster covers (refer to procedure 4.5).

8. Ensure that the brake/steer pedal is in the neutral position.

9. Using the side cutters, remove the two large cable ties (A) that secure the hilow position sensor and cable assembly (B) to the foot lift sensor mounting bracket (C) and head lift sensor mounting bracket (D) (see figure 4-50 on page 4-144).

Figure 4-50. Hilow Position Sensor



10. Using a wrench, loosen the two nuts (E) that secure the hilow position sensor and cable assembly (B) to the lower lift sensor links (F).

11. Remove the hilow position sensor cable assembly (B) from the lower lift sensor links (F), the foot lift sensor mounting bracket (C), and head lift sensor mounting bracket (D).

12. Disconnect the hilow position sensor cable assembly (B) from the weigh frame junction electrical box, and remove it from the base frame.

Replacement

1. Perform the removal procedure in reverse order.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.45 Battery

Tools required:	Hilow cylinder brace (P/N SA1695) T25 Torx®[1] wrench 4" needle nose pliers Blocks

Removal

WARNING:
To avoid personal injury, do not short the battery terminals.

1. Set the brakes.

2. Block the wheels, and use the head siderail **Bed Up** switch to raise the bed.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (A) (refer to procedure 6.1) (see figure 4-51 on page 4-146).

6. Remove the head and tub covers (refer to procedure 4.3).

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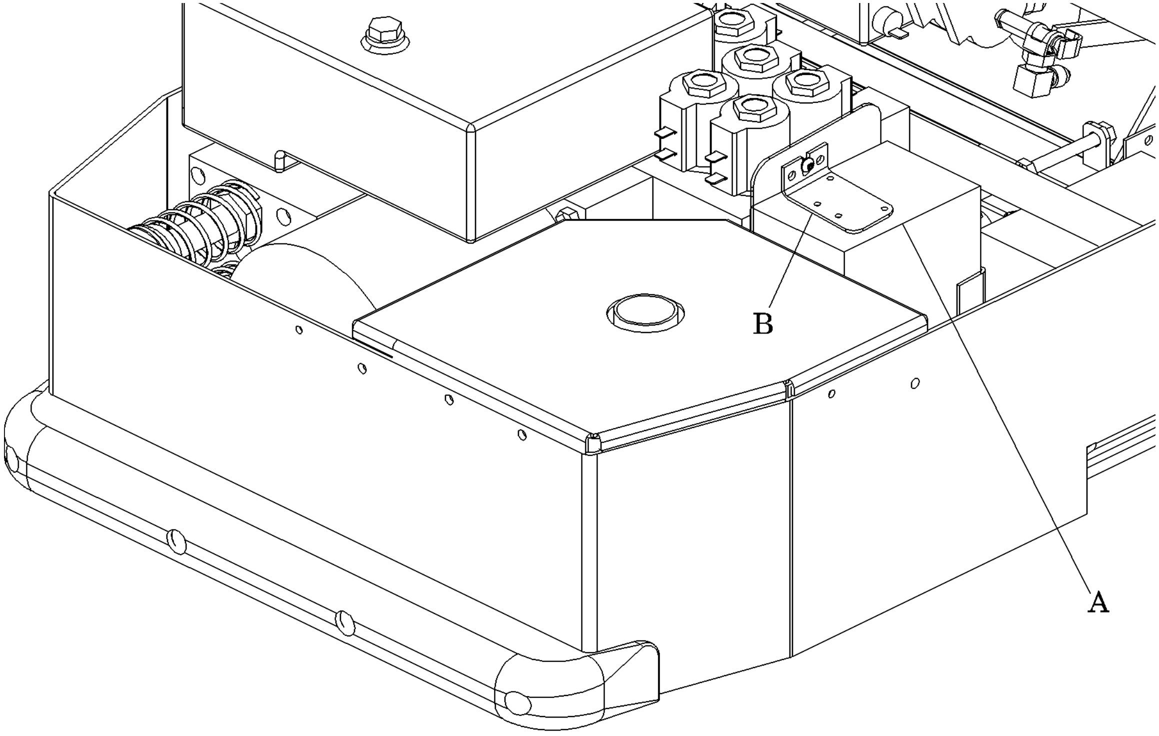
Figure 4-51. Battery



7. Using the needle nose pliers, disconnect the positive and negative cables from the battery (A) spade terminals.

8. Using a T25 Torx®[1] wrench, remove the bolt and the battery clamp (B) from the battery compartment.

9. Carefully lift the battery (A) from the battery compartment.

10. Dispose of the old battery properly. Consult with your company's environmental department.

Replacement

1. Perform the removal procedure in reverse order.

2. Observing the electrical polarity of the battery (A), connect the battery (A) spade terminals to the circuit wiring.

3. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.46 Transformer

Tools required:	Hilow cylinder brace (P/N SA1695) T25 Torx®[1] wrench Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)

Removal

WARNING:
Set the brakes, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Set the brakes.
2. Block the wheels.
3. Press the head siderail **Bed Up** switch to raise the bed, and install the hilow cylinder brace (refer to procedure 4.4).
4. Position the bed at a height that provides easy access to the transformer.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

5. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

6. Disable the battery (refer to procedure 6.1).
7. Remove the head and tub covers to gain access to the transformer (A) (refer to procedure 4.3) (see figure 4-52 on page 4-148).

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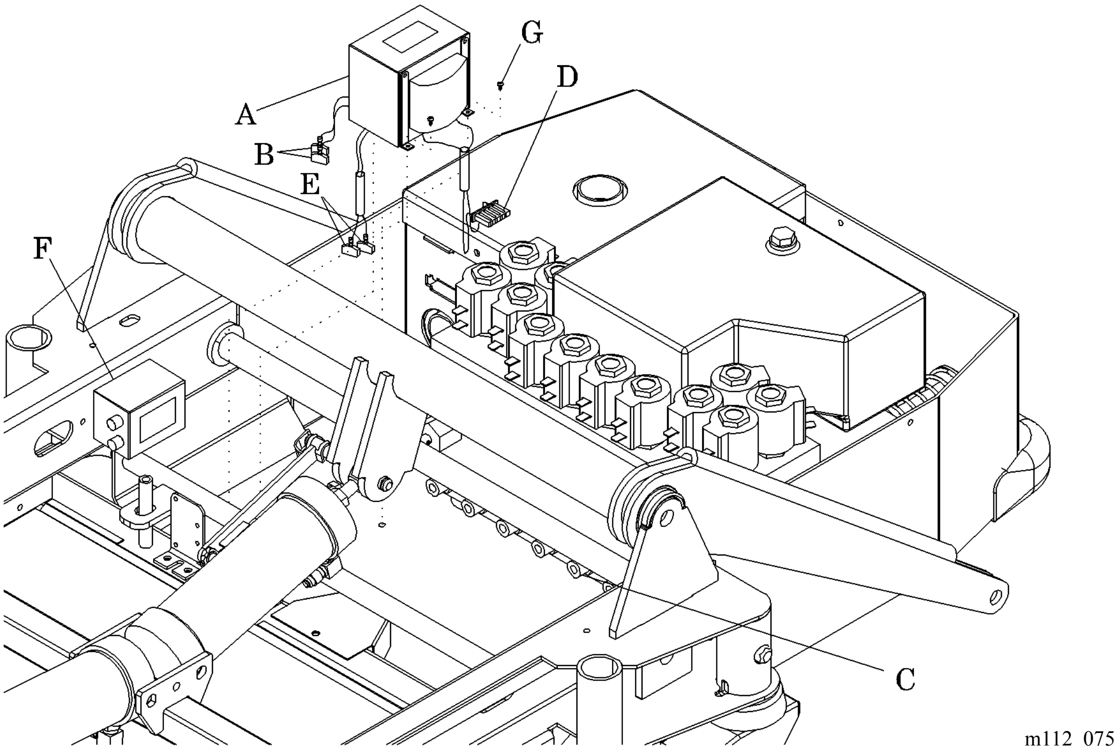
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-52. Transformer Replacement



8. Disconnect the transformer cables (T1) and (T2) from the full-wave bridge (B) assembly.

9. Disconnect the + 5 volt (NL1) transformer cable from the power supply P.C. board assembly.

10. Disconnect transformer cables (T3 and T4) from the line filter (F).

11. Using a T25 Torx®[1] wrench, remove the four mounting bolts (G) that secure the transformer (A) to the frame bottom plate.

12. Remove the transformer (A) from the frame bottom plate.

Replacement

1. Ensure the replacement transformer (A) is the same type as the one removed.

2. Install the transformer (A).

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3. Using a T25 Torx®[1] wrench, install the four mounting bolts (G) that secure the transformer (A) to the frame bottom plate.
4. Using a torque wrench, torque the four mounting bolts (G) to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
5. Connect transformer cables (T3 and T4) to the line filter (F).
6. Connect the + 5 volt (NL1) transformer cable to the Power Control Module P.C. board assembly.
7. Connect the transformer cables (T1) and (T2) to the full-wave bridge (B) assembly.
8. Verify the operation of the transformer (A).
9. Install the base frame covers (refer to procedure 4.3).
10. Remove the hilow cylinder brace.
11. Plug the bed into an appropriate power source.
12. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.
13. Remove the wheel blocks, and return the system to service.

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[1] Torx® is a registered trademark of Textron, Inc.

4.47 Power Control Module P.C. Board

Tools required: T25 Torx®[1] wrench
T15 Torx® wrench
Hilow cylinder brace (P/N SA1695)
4" needle nose pliers
AC/DC volt Ohm meter (VOM)
3 AG fuse puller

Removal

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.
2. Remove the tub base cover and top center base cover (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Remove the head, left caster, and tub covers (refer to procedure 4.3).
6. Using a T15 Torx® wrench, remove the two screws (A) and long plastic spacers (F) that secure the Power Control Module P.C. board cover (B) to the Power Control Module P.C. board enclosure (C) (see figure 4-53 on page 4-151).

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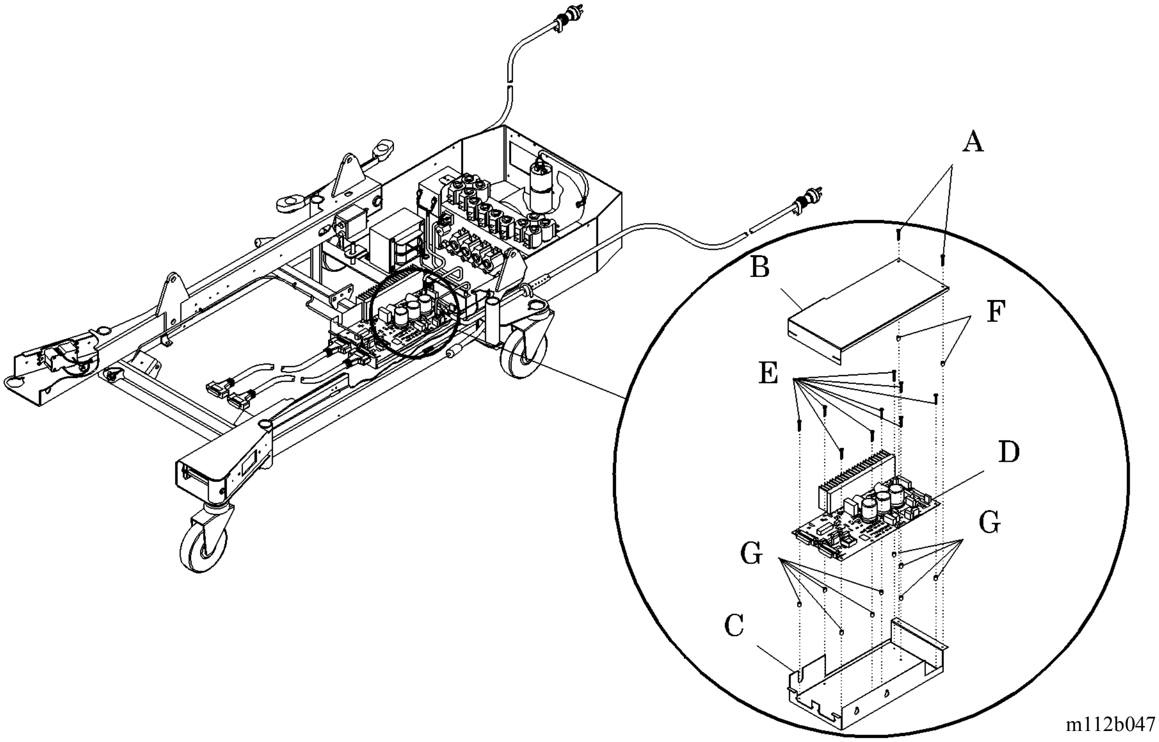
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-53. Power Control Module



7. Check all fuses on the Power Control Module P.C. board assembly (D), and replace any that are open. See “Power Control Module P.C. Board Fuse Locations” on page 4-152 and RAP 2.6.

8. Disconnect the AC power cord connector P11 from the Power Control Module P.C. board assembly (D).

9. Disconnect the transformer F + 5 V DC connector P19, and the + 23V DC P6 connector from the Power Control Module P.C. board assembly (D).

10. Disconnect the AC line filter connector, P17, from the Power Control Module P.C. board assembly (D).

11. Disconnect the battery connector P15, the photosensor connector, P3, and the Patient Exit Detection connector P22.

12. Disconnect the signal connectors P21, P12, P18, P13, P22, P9, P14, P20, P4, P5, P22, and P16 from the Power Control Module P.C. board. See “Power Control Module Connector Locations” on page 4-153.

Figure 4-54. Power Control Module P.C. Board Fuse Locations

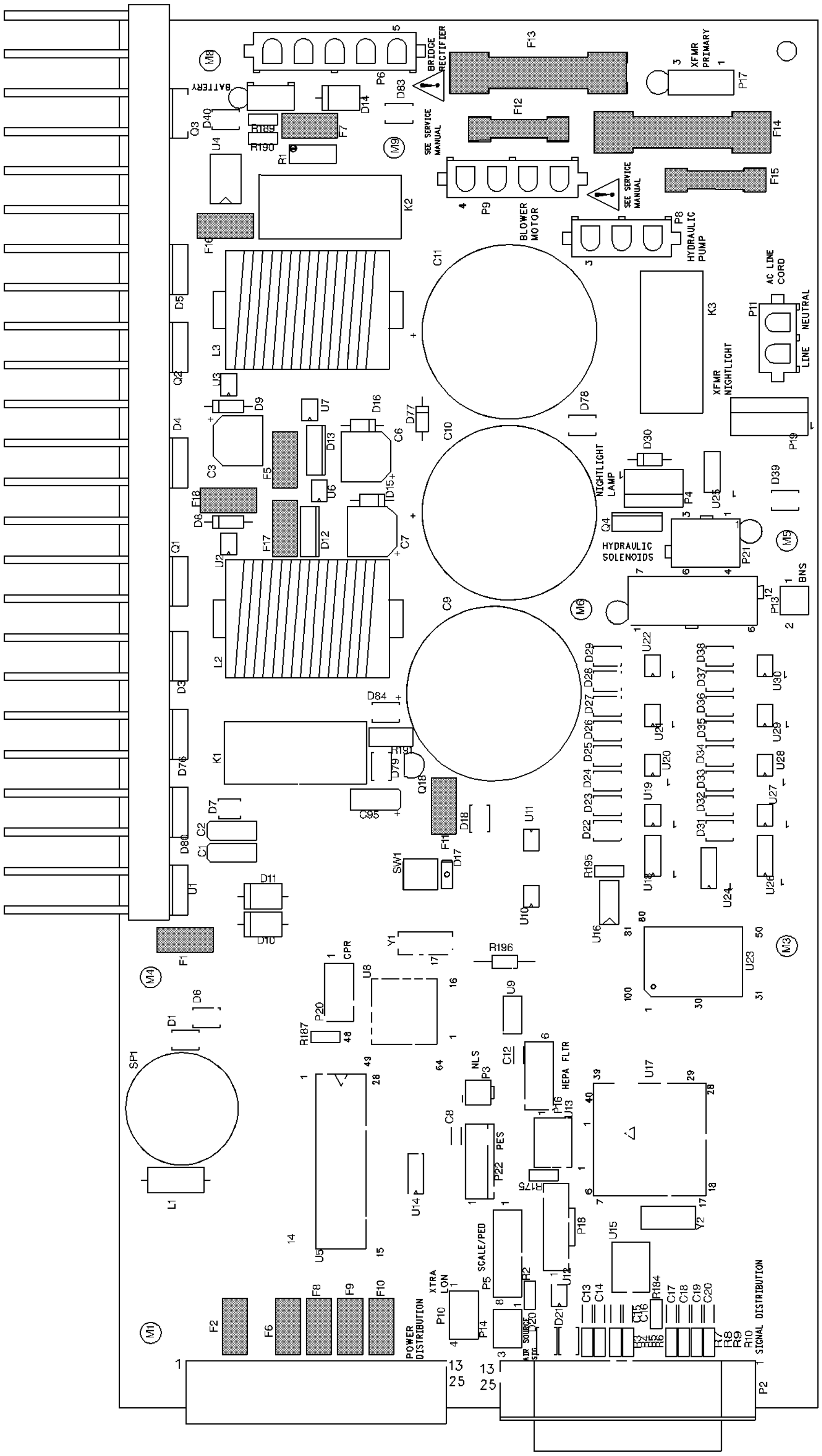

F1
F2
F5
F6
F7
F8
F9
F10
F11
F12
F13
F14
F15
F16
F17
F18
BATTERY
BRIDGE RECTIFIER
SEE SERVICE MANUAL
XFMR PRIMARY
BLOWER MOTOR
HYDRAULIC PUMP
AC LINE CORD
LINE
NEUTRAL
XFMR NIGHTLIGHT
NIGHTLIGHT LAMP
HYDRAULIC SOLENOIDS
BNS
CPR
NLS
HEPA FLTR
PES
SCALE/PED
XTRA LON
POWER DISTRIBUTION
SIGNAL DISTRIBUTION
AIR SOURCE
K1
K2
K3
L1
L2
L3
C9
C10
C11
SP1
SW1
U5
U8
U17
U23
P2
P5
P6
P8
P9
P10
P11
P17
P19
P22

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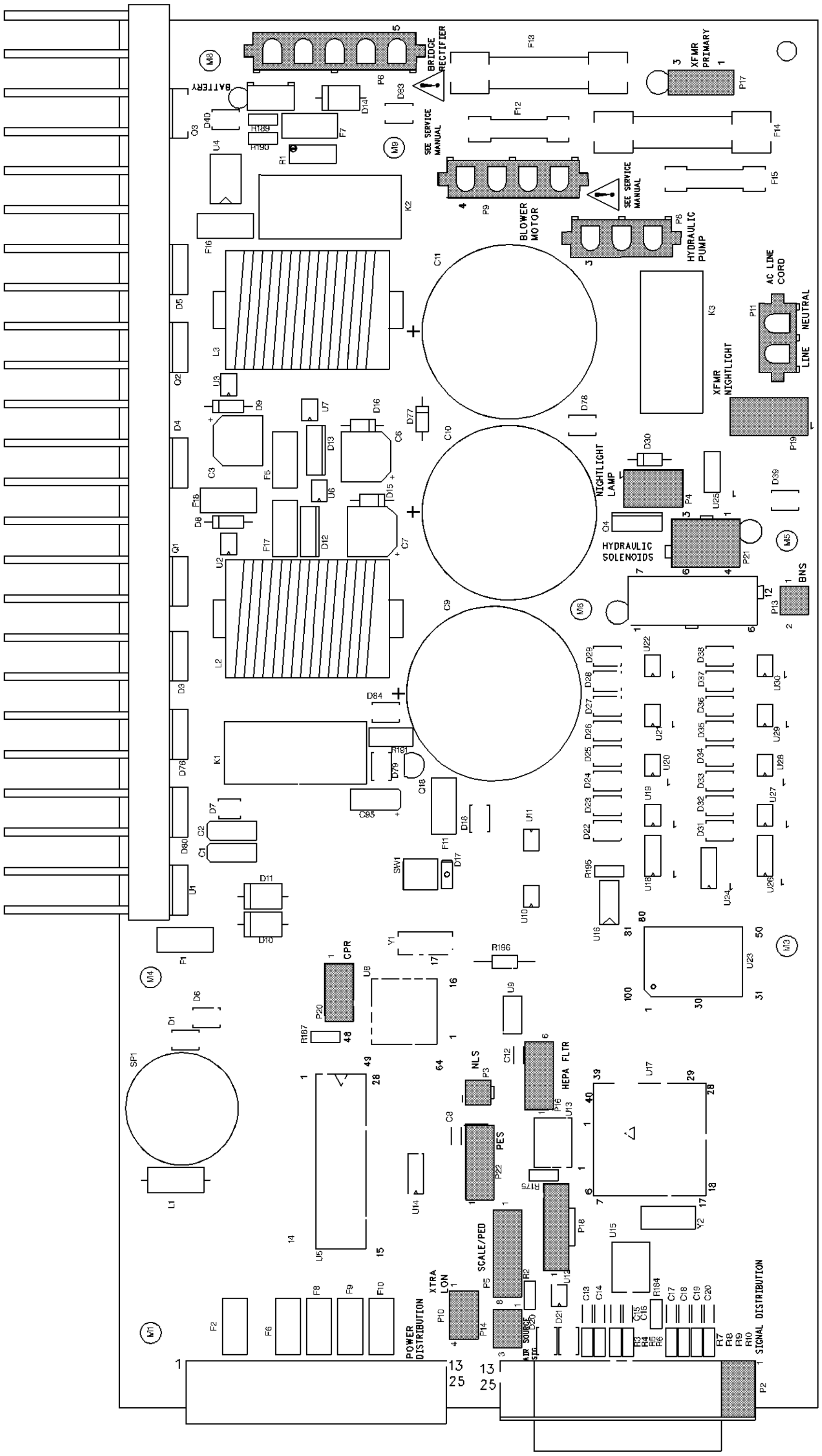
Figure 4-55. Power Control Module Connector Locations


BATTERY
P6
BRIDGE RECTIFIER
SEE SERVICE MANUAL
F13
XFMR PRIMARY
P17
F12
F14
F15
K2
P9
BLOWER MOTOR
P8
HYDRAULIC PUMP
AC LINE CORD
P11
LINE
NEUTRAL
K3
XFMR NIGHTLIGHT
P19
C11
C10
C9
L3
L2
K1
NIGHTLIGHT LAMP
P4
HYDRAULIC SOLENOIDS
P21
BNS
P13
CPR
P20
U8
U23
NLS
P3
HEPA FLTR
P16
U17
PES
P22
SCALE/PED
P5
P18
XTRA LON
P10
AIR SOURCE
P14
POWER DISTRIBUTION
SIGNAL DISTRIBUTION
P2
SP1
L1
F1
F2
F6
F8
F9
F10
U5
M1
M3
M4
M5
M6
M8
M9

m112_156

⚠ **CAUTION:**
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

⚠ **CAUTION:**
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

13. Using a T15 Torx®[1] wrench, remove the nine screws (E) and long plastic spacers (G) that secure the Power Control Module P.C. board assembly (D) to the Power Control Module P.C board enclosure (C) (see figure 4-53 on page 4-151).

14. By its edges, remove the Power Control Module P.C. board assembly (D) from the Power Control Module P.C. board enclosure (C).

Replacement

NOTE:
Ensure that the long plastic spacers are in place when replacing the Power Control Module P.C. board assembly and the screws.

1. Perform the removal procedure in reverse order.

2. From the **Diagnostic** screen on the Graphical Caregiver Interface (GCI)® Control, send a **10-166** code.

3. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.48 Weigh Frame Junction Electrical Box

Tools required: Hilow cylinder brace (P/N SA1695)
Ohm meter
T15 Torx®[1] wrench

Removal

1. Raise the bed.
2. Remove the tub base cover and top center base cover (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).
6. Remove the assembly cover.
7. From the weigh frame junction electrical box, disconnect the electrical connectors P2, P3, P4, P5, P8, P10, and P11(see figure 4-56 on page 4-156).

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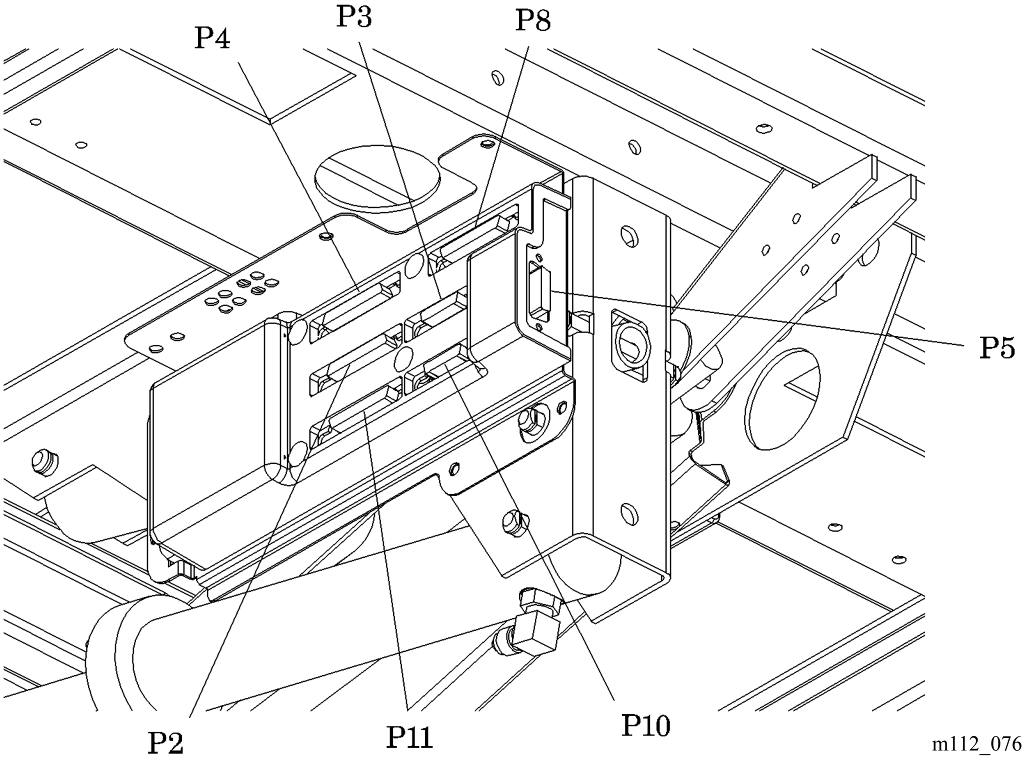
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-56. Weigh Frame Electrical Junction Box



8. Using a T15 Torx®[1] wrench, remove the four screws (A) that secure the junction box cover (B) to the junction box base plate (C) (see figure 4-57 on page 4-157).

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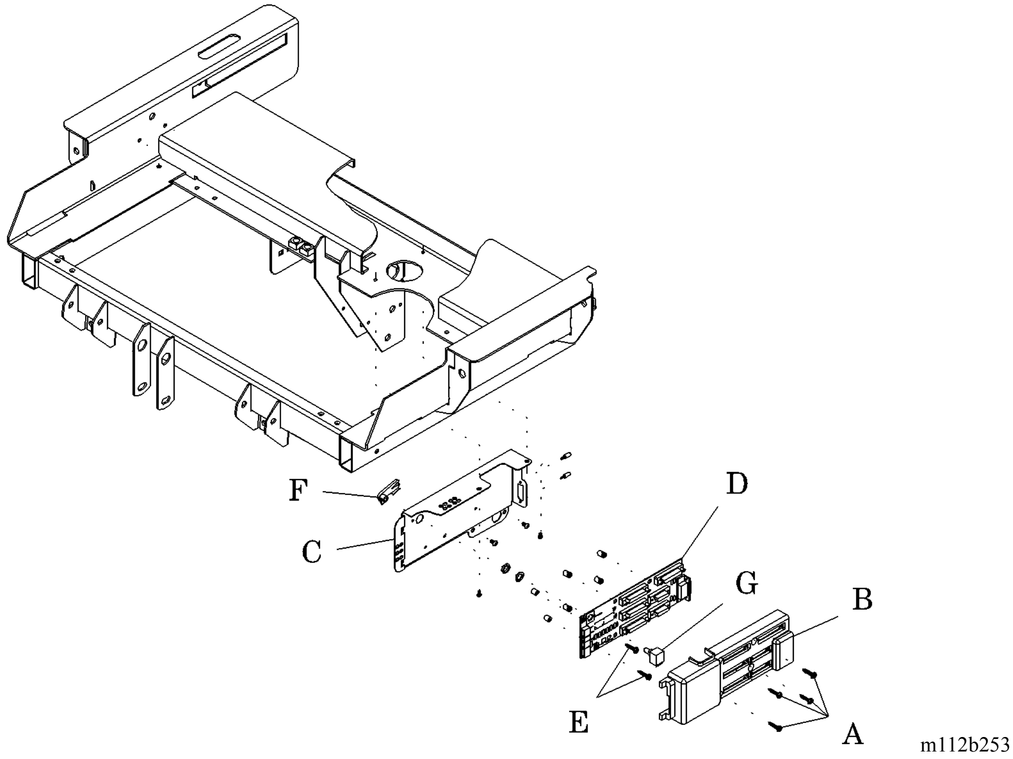
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-57. Weigh Frame Electrical Junction Box Removal



9. Remove the cable ties and the hardware that secure the wires and cables attached to the weigh frame junction box P.C. board assembly (D).

10. Disconnect the weigh frame junction box P.C. board assembly (D) board cables/wires P9, P12, P14, P15, and P16 (refer to procedure 4.49).

11. Disconnect the connectors JP3 and JP2 from the weigh frame junction box P.C. board assembly (D).

12. Slowly lift the left end of the weigh frame junction box P.C. board assembly (D) outward and away from the junction box base plate (C), and remove the thigh sensor crank (F) of the knee sensor potentiometer (G), M1, from the sensing linkage.

13. Using a T15 Torx®[1] wrench, remove the two screws (E) that secure the weigh frame junction box P.C. board assembly (D) to the junction box base plate (C).

14. Loosen the connector nuts on P5.

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[1] Torx® is a registered trademark of Textron, Inc.

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

15. Move the weigh frame junction box P.C. board assembly (D) outward and to the left to escape the junction box base plate (C) P5 bracket, and by its edges, remove the weigh frame junction box P.C. board assembly (D) from the junction box base plate (C).

16. Using an ohm meter, measure and record the electrical position of the knee sensor potentiometer (G), M1.

17. Remove the junction box base plate (C) from the frame.

Replacement

1. Using an ohm meter, set the knee sensor potentiometer (G), M1, to the same electrical position as recorded in the removal step 16 above.

2. Perform the removal procedure in reverse order.

3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.49 Weigh Frame Junction P.C. Board

Tools required:	Hilow cylinder brace (P/N SA1695)
	T15 Torx®[1] wrench
	Ohm meter

Removal

1. Raise the bed.
2. Remove the tub base cover and top center base cover (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).
6. From the weigh frame junction electrical box, disconnect the electrical connectors P2, P3, P4, P5, P8, P10, and P11 (see figure 4-58 on page 4-160).

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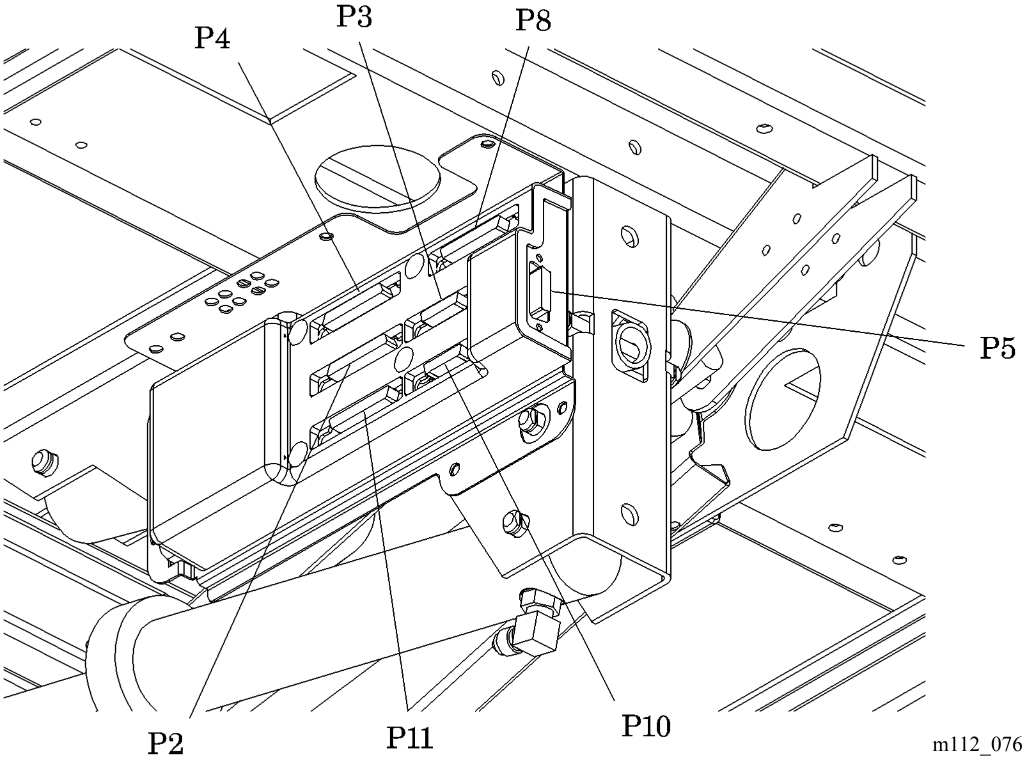
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-58. Weigh Frame Electrical Junction Box



7. Using a T15 Torx®[1] wrench, remove the four screws (A) that secure the junction box cover (B) to the junction box base plate (C) (see figure 4-59 on page 4-161).

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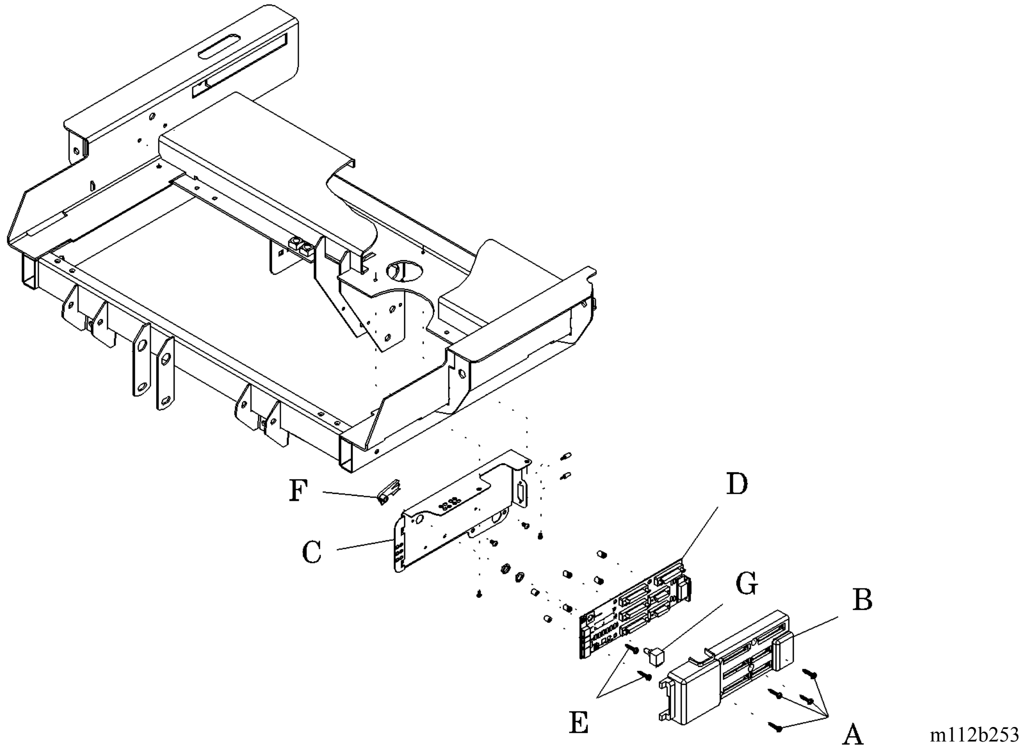
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-59. Junction Box P.C. Board Removal



8. Remove the junction box cover (B).

9. Remove the cable ties and the necessary hardware that secure the wires and cables attached to the junction box P.C. board assembly (D).

10. Disconnect the junction box P.C. board assembly (D) cables/wires P9, P12, P14, P15, and P16.

11. Disconnect the connectors JP2 and JP3 from the junction box P.C. board assembly (D).

12. Using a T15 Torx®[1] wrench, remove the mounting screws (E) that secure the junction box P.C. board assembly (D) to the junction box base plate (C).

13. Slowly lift the left end of the junction box P.C. board assembly (D) away from the junction box base plate (C), and remove the shaft of the knee sensor potentiometer (G), M1, from the sensing linkage (F).

14. Loosen the connector nuts on P5 (see figure 4-58 on page 4-160).

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⚠ **CAUTION:**
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

⚠ **CAUTION:**
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

15. Move the junction box P.C. board assembly (D) outward and toward the left to escape the P5 bracket, and remove it, by its edges, from the junction box base plate (C) (see figure 4-58 on page 4-160).

16. Using an ohm meter, check the electrical position of the knee sensor potentiometer (G).

Replacement

1. Set the knee sensor potentiometer (G), M1, to the same electrical position as found in the removal step 16, above.

2. Grasp the knee sensor linkage, and insert the shaft of the knee sensor potentiometer (G) into the sensing linkage (F). Ensure that the sensing linkage (F) and the shaft of the knee sensor potentiometer (G) flat match.

3. Perform the removal procedure in reverse order.

4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.50 Scale Control—Patient Exit Detection (PED) Module

Tools required: Hilow cylinder brace (P/N SA1695)
T25 Torx®[1] wrench
T15 Torx® wrench

Removal

1. For P1900D model beds, ensure the software revision, located on the EPROM, is revision 009 or higher.
2. Set the brakes.
3. Raise the bed.
4. Remove the tub base cover and top center base cover (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

5. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

6. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

7. Disable the battery (refer to procedure 6.1).
8. Using a T25 Torx® wrench, loosen the mounting bolts (A) that secure the scale assembly module to the base frame (see figure 4-60 on page 4-164).

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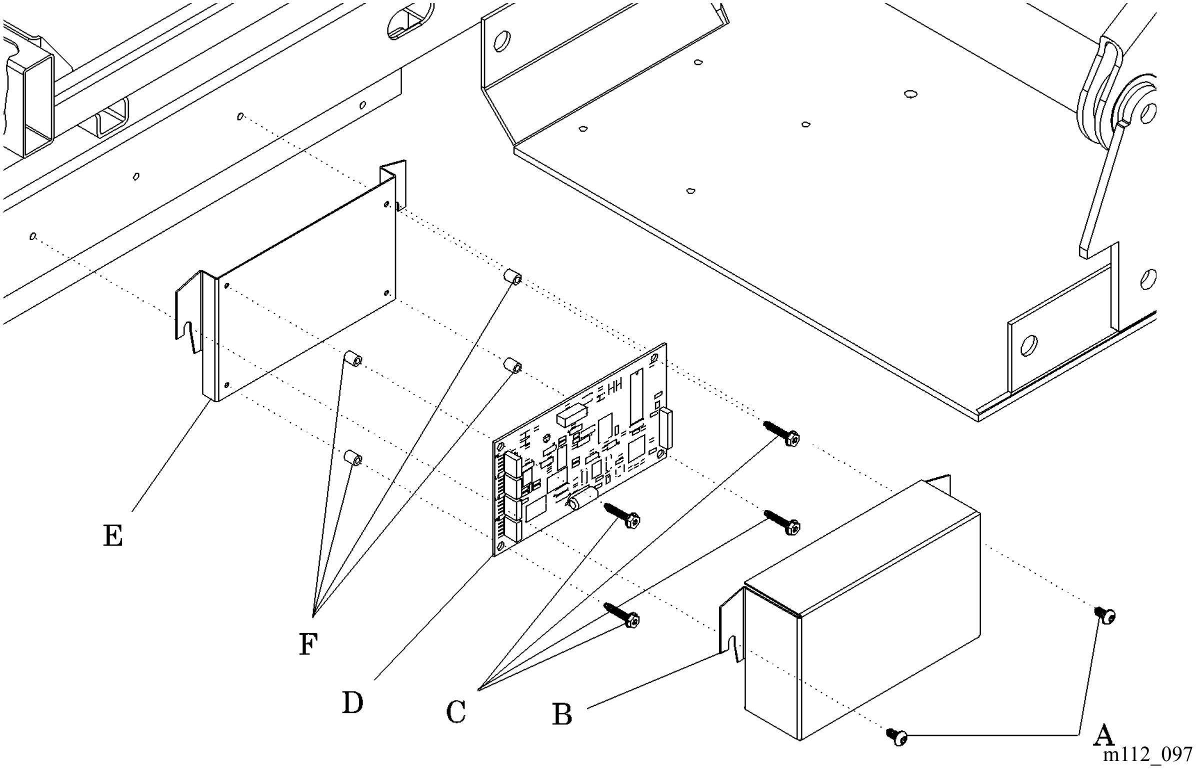
Figure 4-60. Scale Assembly Module



9. Slide the scale assembly module upward, and remove it from the base frame.

10. Support the base plate (E) and its cabling, and remove the module cover (B) from the scale assembly module.

11. Slide the base plate (E) onto the mounting bolts (A).

12. Disconnect all cable connectors from the P.C. board (D).

13. With care, support the base plate (E) and its cabling, and remove the module cover (B) from the base plate (E).

14. Using a T15 Torx®[1] wrench, remove the mounting bolts (C) that secure the P.C. board (D) and four spacers (F) to the base plate (E).

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[1] Torx® is a registered trademark of Textron, Inc.

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

15. By its edges, remove the P.C. board (D) and four spacers (F) from the base plate (E).

Replacement

1. Perform the removal procedure in reverse order.
2. Connect the four weigh frame load cells and the auxiliary power supply cable connectors, P1 through P5, to the P.C. board (D). Ensure that the correct beam wires are on the connectors.
3. Calibrate the scale:
    - On a NAWI Class IIII Scale—European version, refer to procedure 6.6.
    - On a **non**-NAWI Class IIII Scale, refer to procedure 4.2.
4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.51 Weigh Load Beam

Tools required: T25 Torx®[1] head screwdriver
Torque wrench, 50 in-lb to 150 in-lb (5.6 N·m to 16.9 N·m)
Calibration weights 200 lb (91 kg)
4" diagonal cutters
Hilow cylinder brace

Removal

1. Using the head siderail **Bed Up** switch, raise the weigh frame to its maximum height.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the base frame head cover (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

5. Install the hilow cylinder brace (refer to procedure 4.4).
6. Remove the headboard (refer to procedure 4.16).
7. Remove all weight and the sleep surface from the weigh frame surface.
8. Disconnect the load beam cable from the applicable Scale Module connector (refer to procedure 4.50).

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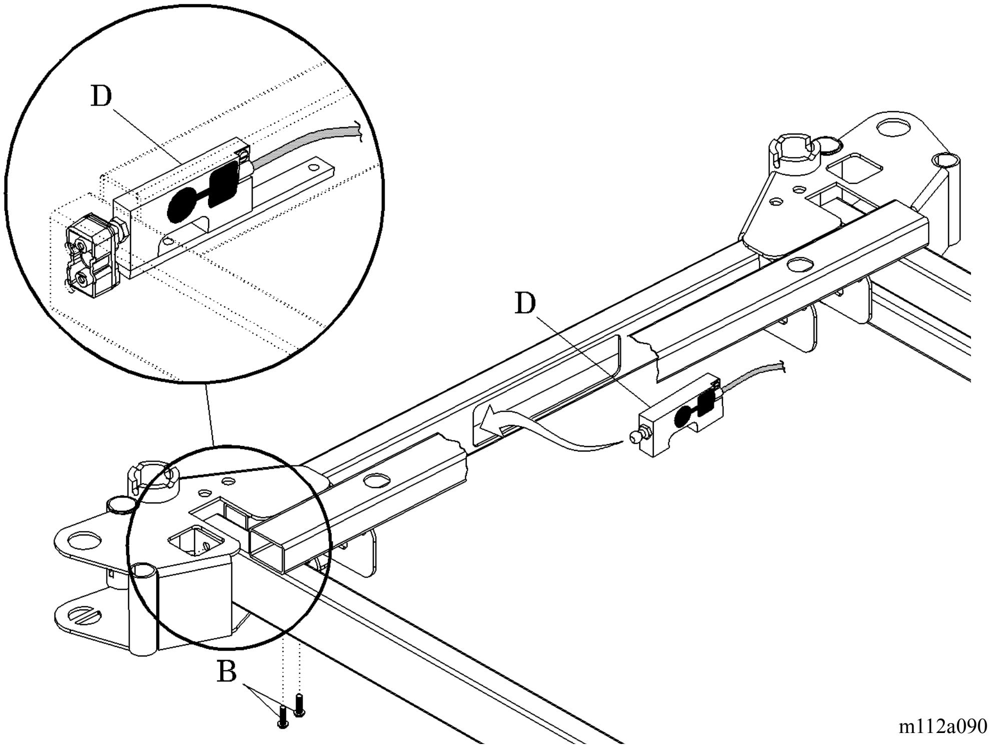
[1] Torx® is a registered trademark of Textron, Inc.

9. Using the 4" diagonal cutters, cut the cable ties that secure the load beam cable.

10. Remove the two screws (B) that secure the bottom of the load beam (D) to the intermediate frame (see figure 4-61 on page 4-167).

Figure 4-61. Weigh Load Beam



11. Using a second person or proper blocking, support the corner of the weigh frame.

12. Gently lift the weight of the weigh frame from the load beam (D).

13. With the load beam (D) free, gently pull on the load cell cable to carefully fish the load cell out from the intermediate frame channel toward the position of the load beam (D).

14. Using a T25 Torx®[1] wrench, remove the ¼" plate from the bottom of the load beam (D).

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Replacement

1. Using a T25 Torx®[1] wrench, mount the ¼" plate to the bottom of the load beam (D).
2. Using a torque wrench, torque the mounting bolts to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
3. Insert the load beam (D) and ¼" plate into the intermediate frame, and slide it into position.
4. Align the load beam (D) mounting holes with the intermediate frame, and verify that the ball of the load beam (D) is seated into the load bearing block mount.
5. Using a T25 Torx® screwdriver, partially install a screw (B) into the slotted mounting hole of the ¼" plate on the load beam (D).
6. Align the second mounting hole, and torque the screws (B) to 90 in-lb ± 10 in-lb (10.2 N•m ± 1.1 N•m).
7. Calibrate the scale:
    - On a NAWI Class IIII Scale—European version, refer to procedure 6.6.
    - On a **non**-NAWI Class IIII Scale, refer to procedure 4.2.
8. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

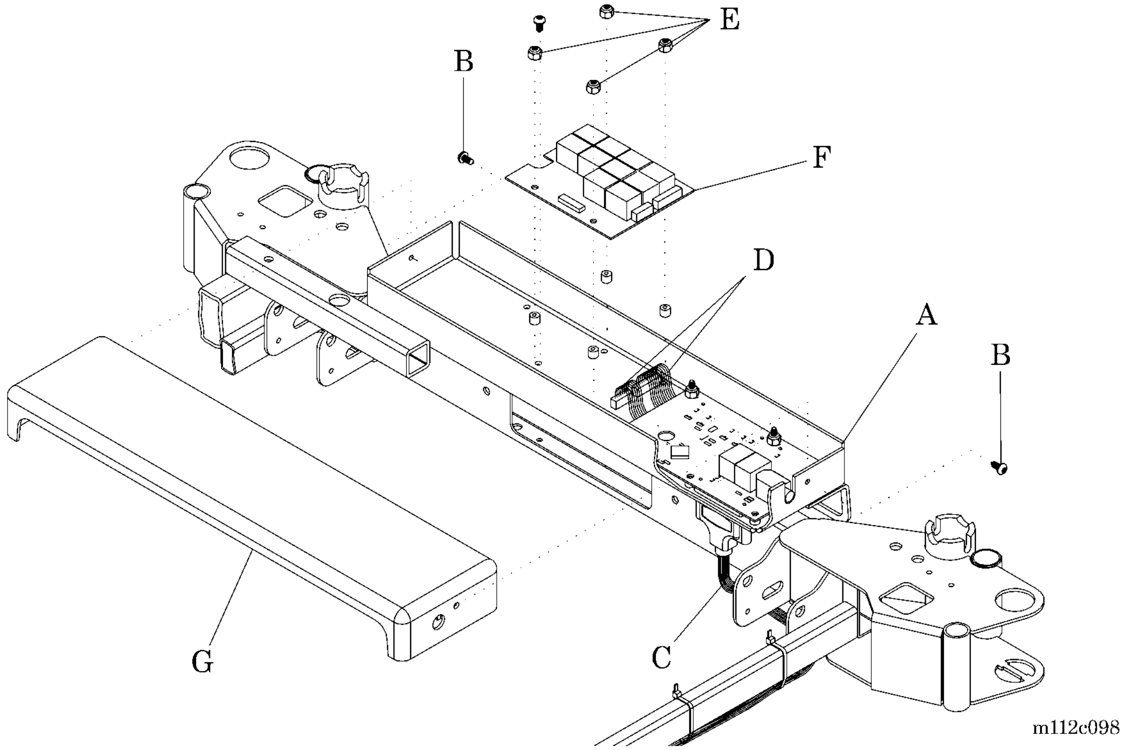
4.52 SideCom® Communication System Entertainment/Lighting Module

Tools required: T25 Torx®[1] wrench
Nut driver

Removal

1. Using the positioning controls, place the frame at a convenient height to gain access to the SideCom® Communication System (A) (see figure 4-62 on page 4-169).

Figure 4-62. SideCom® Communication System Entertainment/Lighting P.C. Board



SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

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SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the headboard (refer to procedure 4.16).
5. Using a T25 Torx®[1] wrench, remove the two mounting screws (B) that secure the cover (G) to the ends of the SideCom® Communication System (A).
6. Remove the cover (G) from the SideCom® Communication System module (A).
7. Disconnect the weigh frame cable assembly (C) from the left end of the SideCom® Communication System (A).
8. Disconnect the two interconnecting cables (D) from the Nurse Call/Patient Exit Detection P.C. board.
9. Using a nut driver, remove the four mounting nuts (E) that secure the entertainment/lighting P.C. board (F) to the SideCom® Communication System (A).

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

10. By its edges, remove the entertainment/lighting P.C. board (F) from the SideCom® Communication System (A).

Replacement

1. Perform the removal procedure in reverse order.

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[1] Torx® is a registered trademark of Textron, Inc.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

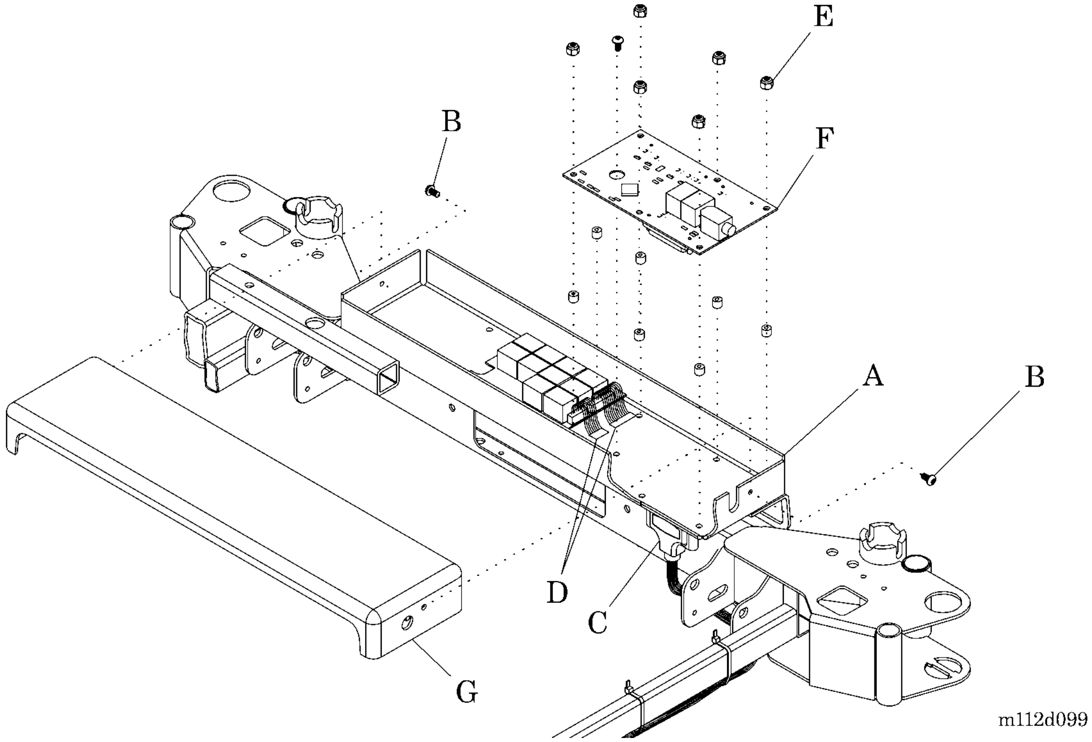
4.53 SideCom® Communication System and Nurse Call Module

Tools required: T25 Torx®[1] wrench
Nut driver

Removal

1. Using the positioning controls, place the frame at a convenient height to gain access to the SideCom® Communication System (A) (see figure 4-63 on page 4-172).

Figure 4-63. SideCom® Communication System Nurse Call/Patient Exit Detection P.C. Board



SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

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SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).

4. Remove the headboard (refer to procedure 4.16).

5. Using a T25 Torx®[1] wrench, remove the two mounting screws (B) that secure the cover (G) to the ends of the SideCom® Communication System (A).

6. Remove the cover (G) from the SideCom® Communication System (A).

7. Disconnect the weigh frame cable assembly (C) from the left end of the SideCom® Communication System (A).

8. Disconnect the two interconnecting cables (D) from the entertainment/lighting P.C. board.

9. Using a nut driver, remove the six mounting nuts (E) that secure the Nurse Call/Patient Exit Detection (PED) P.C. board (F) to the SideCom® Communication System (A).

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

10. By its edges, remove the nurse call/PED P.C. board (F) from the SideCom® Communication System (A).

Replacement

1. Perform the removal procedure in reverse order.

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[1] Torx® is a registered trademark of Textron, Inc.

2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.54 SideCom® Communication System Universal Television (UTV) Module

Tools required: T25 Torx®[1] wrench

Removal

1. Using the positioning controls, place the frame at a convenient height to gain access to the SideCom® Communication System (A) (see figure 4-64 on page 4-176).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Remove the headboard (refer to procedure 4.16).
5. Using a T25 Torx® wrench, remove the two mounting screws (B) that secure the cover (C) to the SideCom® Communication System (A).
6. Remove the cover (C) from the SideCom® Communication System (A).
7. Disconnect the weigh frame cable assembly (D) from the left end of the SideCom® Communication System (A).
8. Disconnect the ribbon cable (E) from the universal television (UTV) P.C. board (F).
9. Using a T25 Torx® wrench, remove the two screws (G) that secure the UTV P.C. board (F) and two plastic spacers (J) to the UTV bracket (H).
10. Remove the standoff (I) that secures the UTV P.C. board (F) to the UTV bracket (H).

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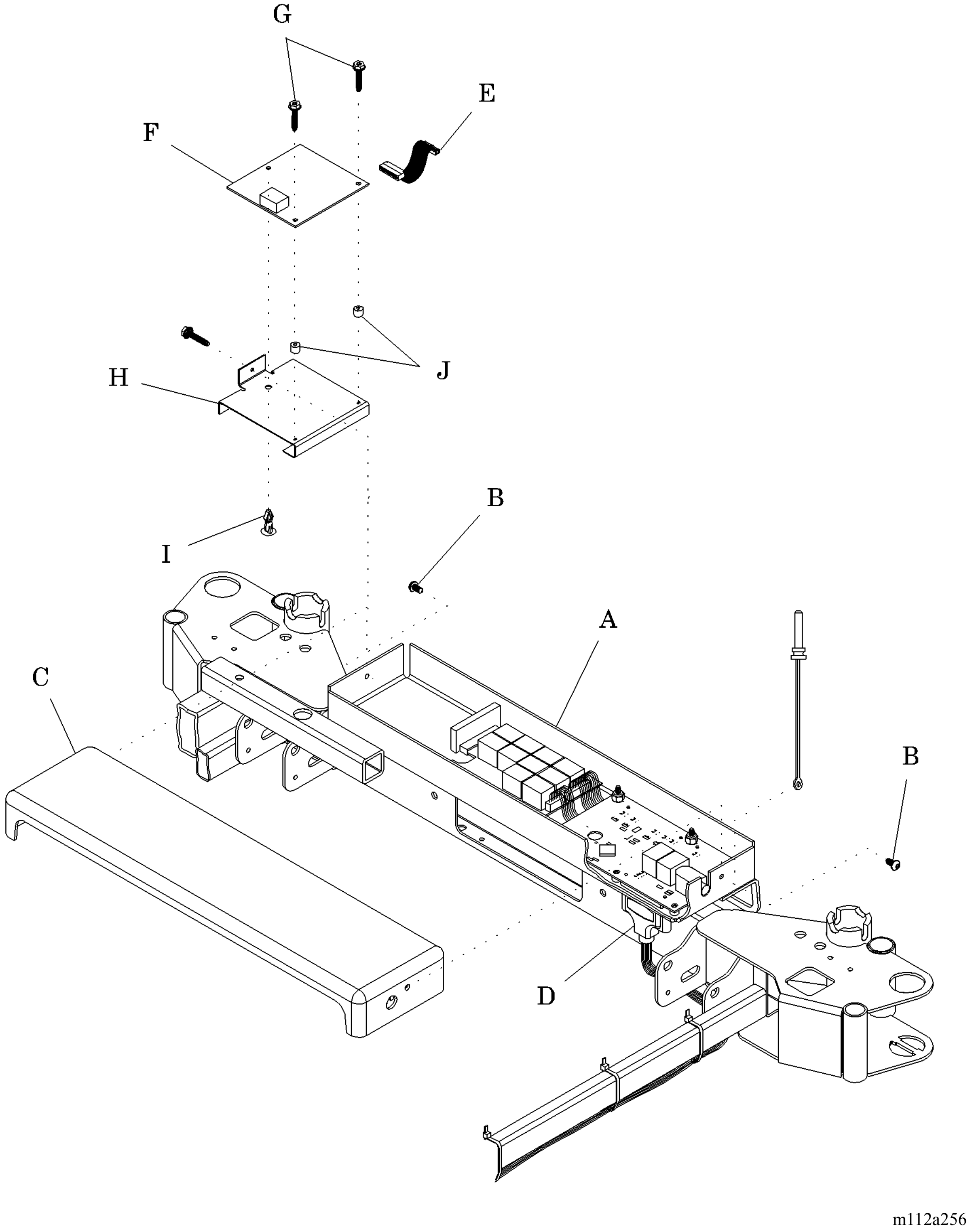
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-64. SideCom® Communication System Universal Television (UTV) Module



CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

CAUTION:
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

11. By its edges, remove the UTV P.C. board (F) and two plastic spacers (J) from the SideCom® Communication System (A).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

4.55 Night Light

Tools required: T25 Torx®[1] wrench
Hilow cylinder brace

Removal

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Using the T25 Torx® wrench, remove the base and head covers from the base frame (refer to procedure 4.3).

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

4. Install the hilow cylinder brace (refer to procedure 4.4).
5. Locate the night light housing (A) (see figure 4-65 on page 4-179).

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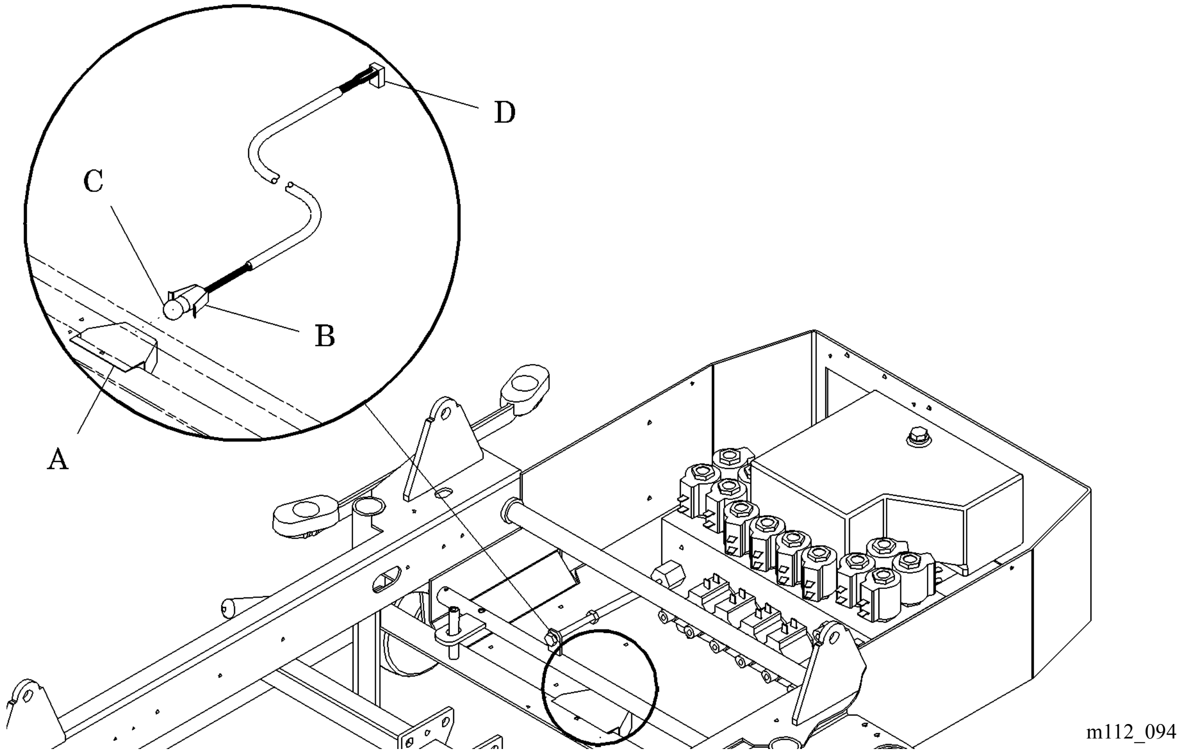
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-65. Night Light



6. Squeeze the sides of the lamp bracket (B).
7. Remove the lamp (C) and the lamp bracket (B) from the night light housing (A).
8. Press in on the lamp (C), twist counter-clockwise, and remove it from the lamp bracket (B).

Replacement

1. Install the new lamp (C) into the socket of the lamp bracket (B).
2. Squeeze together the lamp bracket (B) prongs.
3. Insert the lamp (C) and the lamp bracket (B) into the night light housing (A), and release.
4. Verify that the night light cable plug (D) is properly mated into the Power Control Module plug, P4.
5. Plug the unit into an appropriate power source.

NOTE:
If necessary, cover the photocell in the foot end of the base frame to activate the lamp.

6. Observe the operation of the lamp (C).

7. Remove the cylinder safety braces.

8. Using a T25 Torx®[1] wrench, install the base and head covers (refer to procedure 4.3).

9. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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[1] Torx® is a registered trademark of Textron, Inc.

4.56 Night Light Photo Sensor

Tools required: T25 Torx®[1] wrench
Hilow cylinder brace

Removal

WARNING:
Set the brakes, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Using the T25 Torx® wrench, remove the base and head covers from the base frame (refer to procedure 4.3).
4. Locate the night light photocell (A) (see figure 4-66 on page 4-182).

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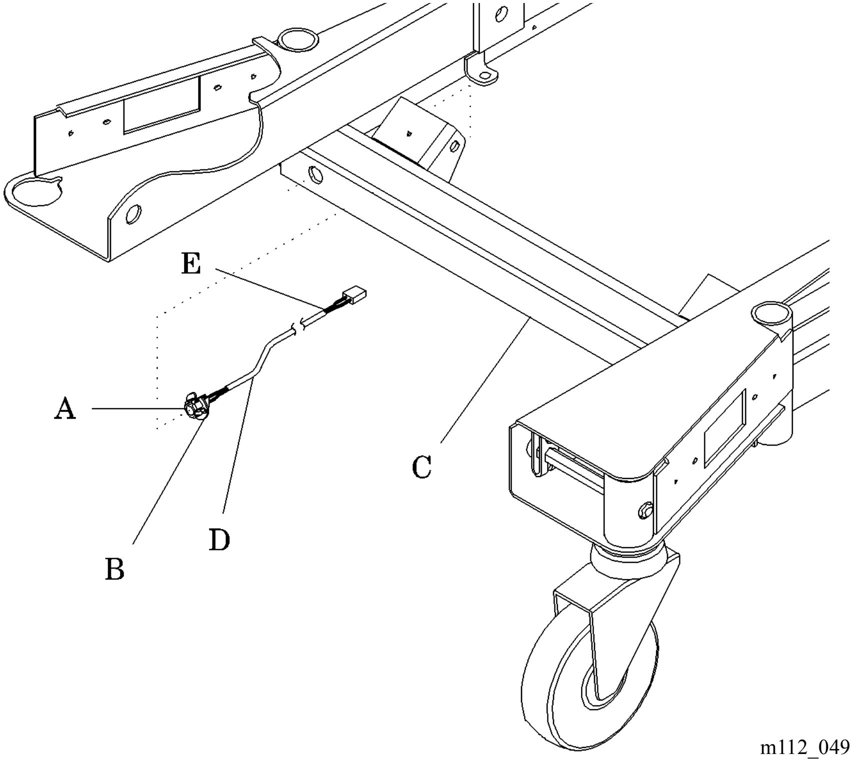
Figure 4-66. Night Light Photo Sensor



5. Remove the plastic snap ring (B) from the face of the photo sensor (D), and remove the photo sensor (D) from the foot end frame (C).
6. Feed the photo sensor (D) and photo sensor cable (E) out through the foot end frame (C).
7. Unplug the photo sensor cable (E) from the Power Control Module.

Replacement

1. Route the new photo sensor cable (E) through the foot end frame (C).
2. Insert the photocell (A) into the photocell hole in the right end of the foot end frame (C).
3. Insert the plastic snap ring (B) over the protruding face of the photo sensor (D).
4. Connect the photo sensor cable (E) to the Power Control Module at P3.
5. Plug the bed into an appropriate power source.

NOTE:
If necessary, cover the photo sensor in the right foot end of the base frame to activate the lamp.

6. Observe the lamp operation.
7. Using a T25 Torx®[1] wrench, install the base and head covers (refer to procedure 4.3).
8. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

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4.57 Accessory Receptacle Module

Tools required: T25 Torx®[1] wrench
5/16" wrench
ground fault detector
Crimping tool
4" diagonal cutters
Hilow cylinder brace

Removal

WARNING:
Set the brakes, and install the hilow cylinder safety brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

1. Using the head siderail **Bed Up** switch, raise the weigh frame to its maximum height.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

3. Disable the battery (refer to procedure 6.1).
4. Using a T25 Torx® wrench, remove the head caster covers from the right-hand side of the bed (refer to procedure 4.3).
5. Using a T25 Torx® wrench, remove the foot caster covers from the right-hand side of the bed (refer to procedure 4.6).
6. Using a 5/16" wrench, remove the nuts (A) and auxiliary power cord clamp from the base frame (see figure 4-67 on page 4-185).

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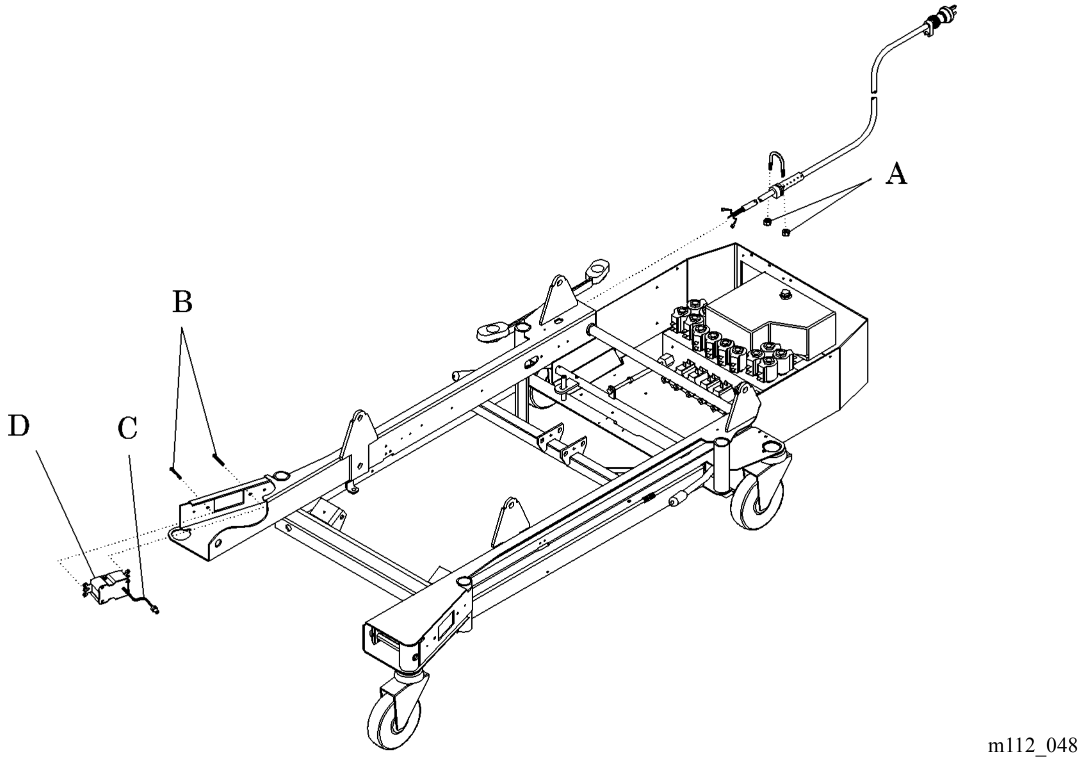
Figure 4-67. Accessory Receptacle Module



7. Using a T25 Torx®[1] wrench, remove the two mounting screws (B) from the base frame.

8. Using 4" diagonal cutters, disconnect the ground lead (C) from the base frame cord ground.

9. Remove the caster hex rod and brake actuating linkage (see figure 4.4 on page 4-21).

10. Remove the accessory receptacle (D) from the base frame.

Replacement

1. Perform the removal procedure in reverse order.

2. Using a crimping tool, crimp the ground lead (C) and the base frame cord ground together.

3. Using a ground fault detector, electrically check the accessory receptacle (D) ground.

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4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.58 Low Noise Blower Assembly

Tools required:	T25 Torx®[1] head screwdriver
	½" socket and ratchet
	#2 phillips head screwdriver
	¼" nut driver

Removal

1. Using the T25 Torx® head screwdriver, remove the tub base cover and center base cover (refer to procedure 4.3).

WARNING:
Set the brakes, and install the hilow cylinder brace before working under the raised section of the bed. Failure to do so could result in personal injury or equipment damage.

2. Set the brakes.

WARNING:
Failure to install the hilow cylinder brace before working under the raised section of the bed could result in personal injury or equipment damage.

3. Install the hilow cylinder brace (refer to procedure 4.4).

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

4. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

5. Disable the battery (refer to procedure 6.1).

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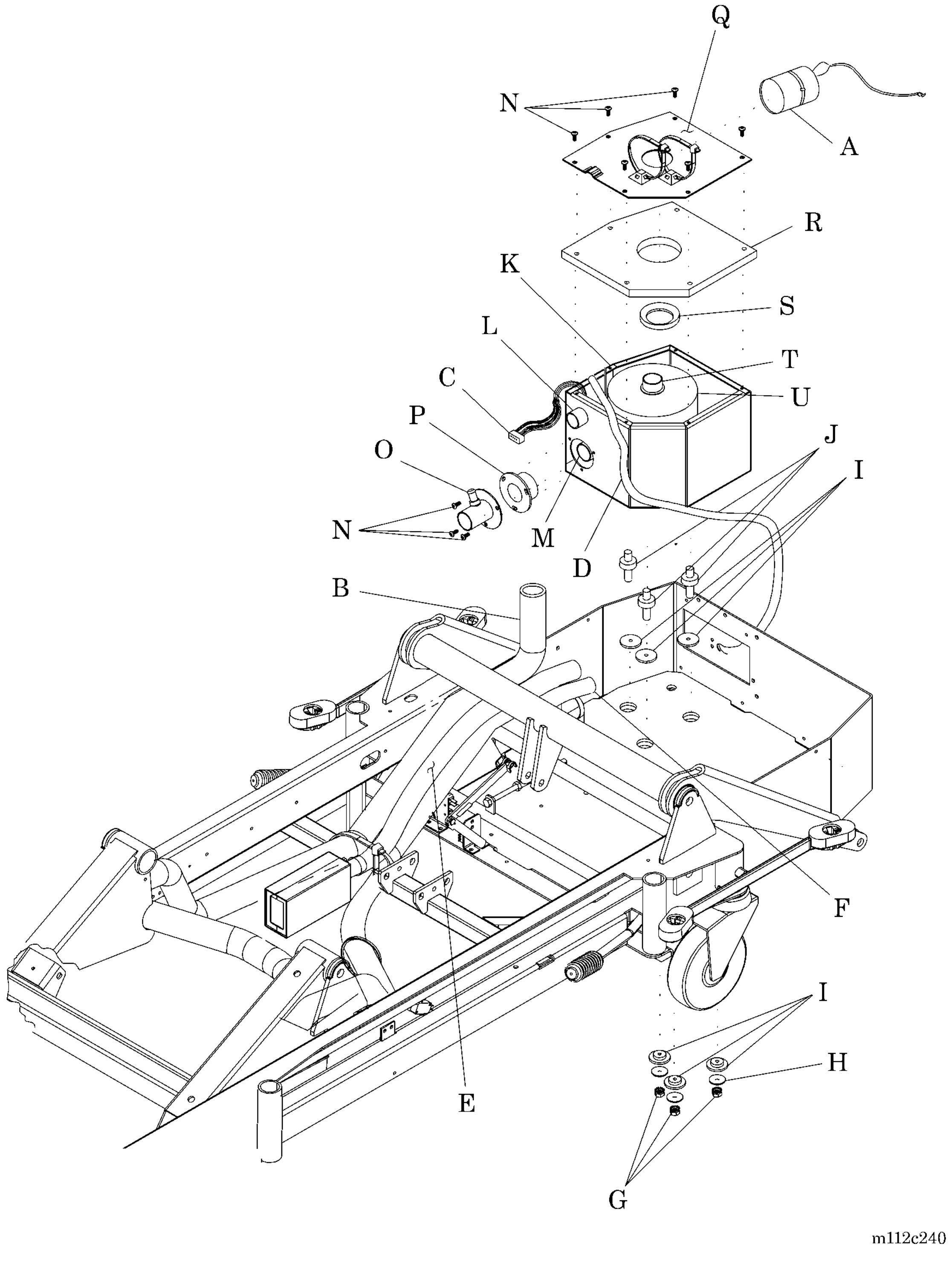
6. Slide the capacitor (A) out from the cable ties on the blower box cover (Q), and remove it from the blower box cover (Q) (see figure 4-68 on page 4-189).

7. Using the ¼" nut driver, loosen the hose clamp, and disconnect the vacuum port hose (B) from the blower box (K).

8. Disconnect the blower power cable (C).

Figure 4-68. Low Noise Blower Assembly


Q
N
A
R
K
S
L
T
C
U
P
J
O
I
N
M
D
B
F
I
H
E
G
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9. Disconnect the pressure vent hose (D) from the tube on the pressure port flange (O).
10. Loosen the hose clamp, and disconnect the intake/exhaust muffler hose (E).
11. Loosen the hose clamp, and disconnect the pressure port hose (F).
12. Using the ½" socket and ratchet, remove the three keps nuts (G), washers (H), and isolation bushings (I) from the three isolation mounts (J) on the bottom of the blower box (K).
13. Remove the blower box (K), three isolation mounts (J), and three isolation bushings (I) from the bed.
14. Place the blower box (K) on its side, with the intake/exhaust port (L) and pressure port (M) facing up.
15. Using the phillips head screwdriver, remove the screws (N) from the pressure port flange (O).
16. Remove the pressure port flange (O) and pressure port seal (P) from the blower box (K).
17. Using the phillips head screwdriver, remove the screws (N) from the blower box cover (Q).
18. Remove the blower box cover (Q) and top insulation foam (R) from the blower box (K).
19. Remove the vacuum port seal (S) from the vacuum port (T) on the blower motor (U).
20. Remove the blower motor (U) from the blower box (K).

Replacement

1. Screw the short ends of the three isolation mounts (J) into the bottom of the blower motor (U).
2. Route the blower power cable (C) under the pressure port (M), and install the blower motor (U) into the blower box (K).
3. Install the vacuum port seal (S) on the vacuum port (T), with the thin edge side facing up.

4. Install the top insulation foam (R) and the blower box cover (Q) on the blower box (K). Route the blower power cable (C) under the indentation in the blower box cover (Q).

5. Using a phillips head screwdriver, secure the blower box cover (Q) and top insulation foam (R) to the blower box (K) with the six screws (N).

6. Place the blower box (K) on its side, with the intake/exhaust port (L) and pressure port (M) facing up.

7. Install one isolation bushing (I) onto each isolation mount (J), with the larger diameter side towards the blower box (K).

8. Apply thread locker to the threads of the three isolation mounts (J).

9. Install the pressure port seal (P) onto the pressure port (M) by aligning the holes in the pressure port seal (P) with the holes in the blower box (K).

10. Align the holes in the pressure port flange (O) with the holes in the pressure port seal (P) and the holes in the blower box (K), and install the pressure port flange (O).

11. Secure the pressure port flange (O) with the screws (N).

12. Place the blower box (K) into the bed frame so that the three isolation mounts (J) go through the holes in the bed frame.

13. Using the ¼" nut driver, install the pressure port hose (F) on the pressure port flange (O), and tighten the hose clamp securely.

14. Connect the blower power cable (C) to the bed frame connector.

15. Install the intake/exhaust muffler hose (E) onto the intake/exhaust port (L), and tighten the hose clamp securely.

16. Install the vacuum port hose (B) onto the vacuum port (T), and tighten the hose clamp securely.

17. Install the isolation bushings (I) onto the isolation mounts (J) under the base tub, with the smaller diameter side facing up towards the base tub.

18. Install the washers (H) and keps nuts (G) on the isolation mounts (J).

19. Tighten the keps nuts (G) until the ends of the isolation mount (J) studs are even with the top of the keps nuts (G). Do not tighten further.

20. Route the pressure vent hose (D) around the blower box (K), and push the end onto the small tube on the pressure port flange (O).

NOTE:
Make sure that the pressure vent hose is completely on.

21. Install the capacitor (A) into the two wire ties on top of the blower box cover (Q). Ensure that the capacitor does not extend past the edge of the hydraulic reservoir.

22. Remove the hilow cylinder braces (refer to procedure 4.4).

23. Install the tub base cover and center base cover (refer to procedure 4.3).

24. Plug the bed into an appropriate power source.

25. Perform a function check of the bed as follows:
    a. Verify that no errors occurred after the power was restored.

NOTE:
Surface initialization of the mattress takes approximately 30 s.

    b. Activate the **Max-Inflate** control, and ensure that the blower turns off within 5 min.
    c. Press the *normal* mode control, and ensure that the *normal* mode is active.
    d. Retract the foot section by any amount, and ensure that the **Heel Suspension** mode is active.
    e. Ensure that the blower turns off within 5 min.
    f. Ensure that the blower stays off for 5 min.

NOTE:
Any movement on the surface of the bed may cause the blower to turn on prematurely.

26. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

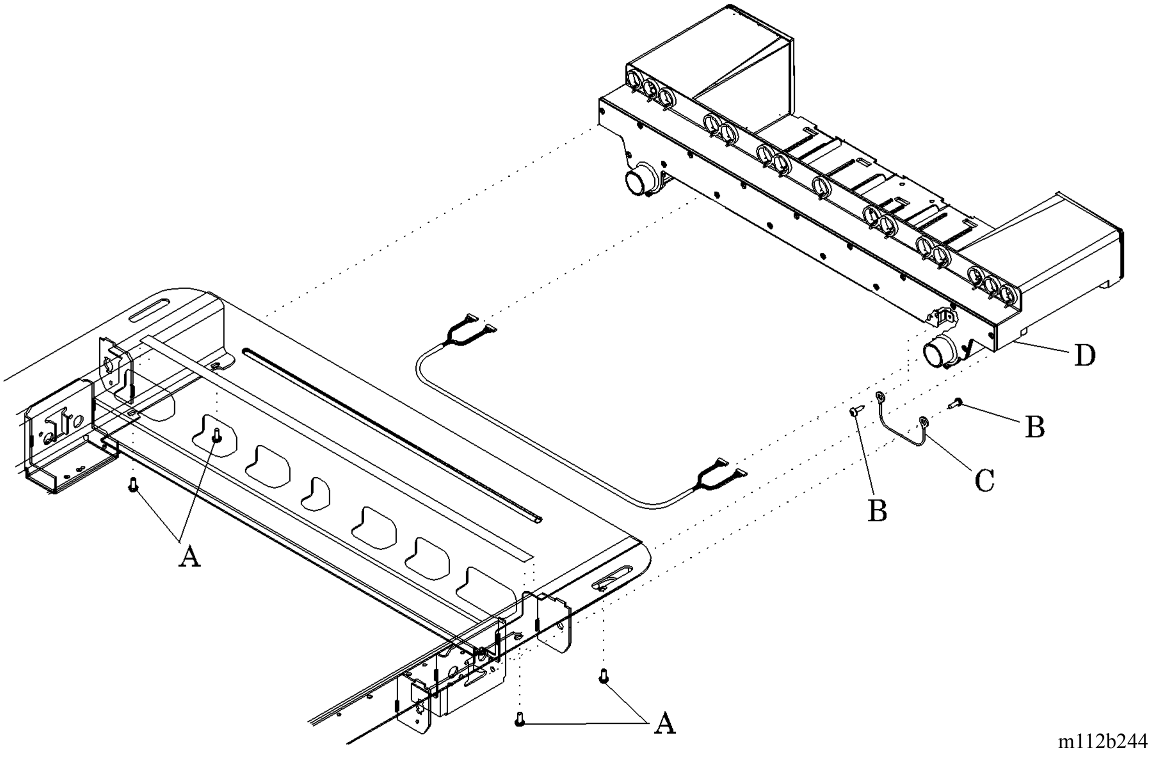
4.59 Air Module—Manifold Assembly

Tools required: T25 Torx®[1] head bit
Phillips head screwdriver
Screwdriver

Removal

1. Remove the treatment foot surface control module (TFSCM) and the treatment surface control module (TSCM) (refer to procedure 4.60).
2. Using the screwdriver with the T25 Torx® head bit, remove the four mounting screws (A) that secure the manifold assembly (D) to the intermediate frame (see figure 4-69 on page 4-193).

Figure 4-69. Air Module—Manifold Assembly



3. Using the screwdriver with the T25 Torx® head bit, remove the two screws (B) and the ground strap (C).
4. Disconnect the air hoses from the manifold connections.

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5. Disconnect the TFSCM cable connections, and carefully pull them through the cable access hole of the manifold assembly (D).

6. Remove the manifold assembly (D).

Replacement

1. Install the TFSCM and the TSCM (refer to procedure 4.60).

1. Route the TFSCM cable through the cable access hole of the manifold assembly (D), and connect the TFSCM cable connections.

2. Connect the air hoses to the manifold connections.

3. Using the screwdriver with the T25 Torx®[1] head bit, install the two screws (B) and the ground strap (C).

4. Using the screwdriver with the T25 Torx® head bit, install the four mounting screws (A) that secure the manifold assembly (D) to the intermediate frame.

5. Using the phillips head screwdriver, install the four sems screws that secure the TFSCM cover (refer to procedure 4.60).

6. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

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4.60 Treatment Foot Surface Control Module (TFSCM) and Treatment Surface Control Module (TSCM)

Tools required: Phillips head screwdriver

Removal

1. To remove the treatment foot surface control module (TFSCM) (D), perform the following (see figure 4-70 on page 4-196):
    a. At the patient head left side, use the phillips head screwdriver to remove the two sems screws (A) that secure the TFSCM cover (B) and access door (C) to the manifold assembly (I).
    b. Remove the TFSCM cover (B) and access door (C) from the manifold assembly (I).

NOTE:
When removing the TFSCM, pay particular attention to the hose connections. Be certain to reinstall in the correct location. Improper connections will result in a fault (see table 2-3 on page 2-22).

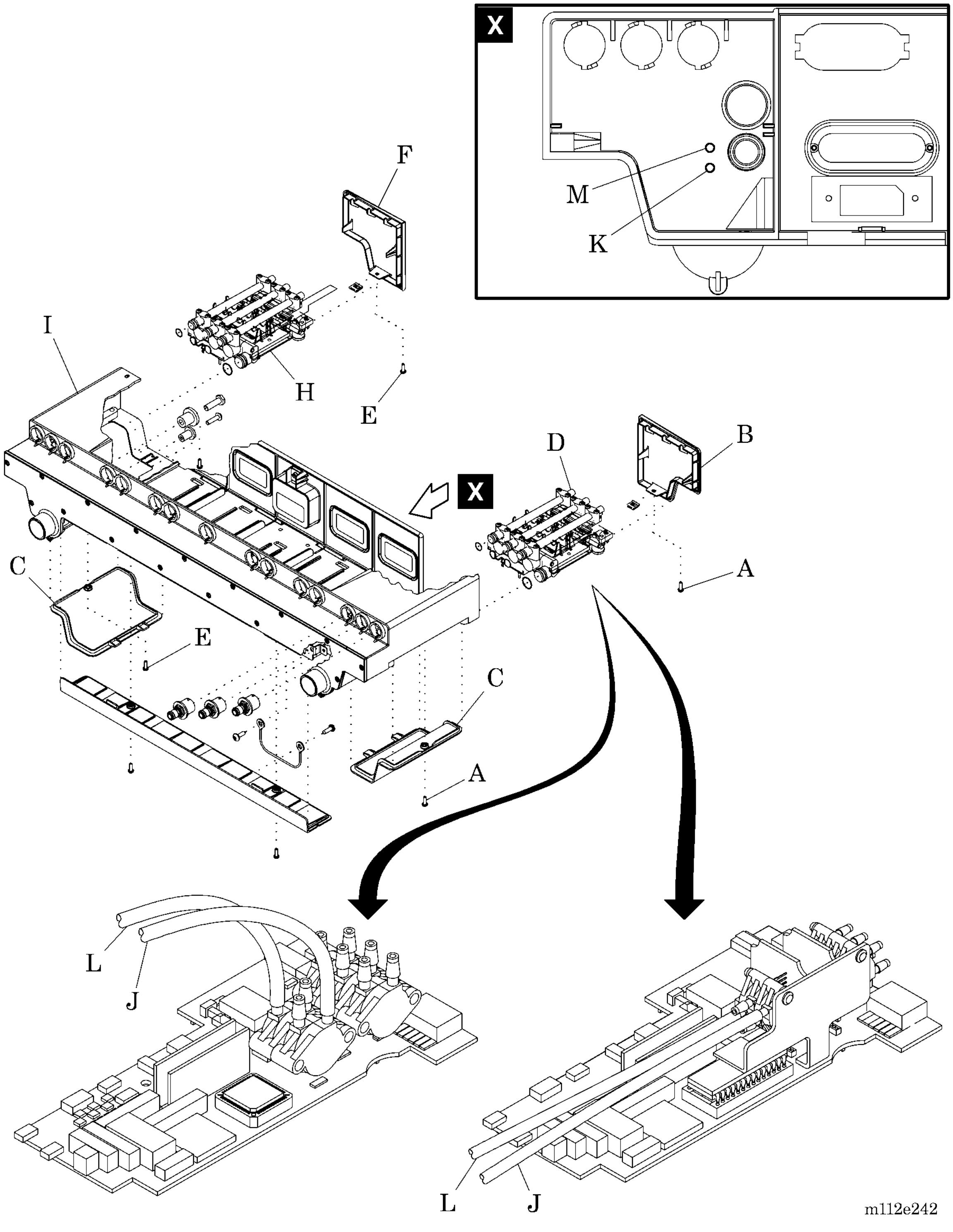
    c. Disconnect the following connections from the TFSCM (D) P.C. board: P1, P2, P5, and P12.
    d. Disconnect the air hose connections from the mattress.
    e. Gently pull the TFSCM (D) straight out from the manifold assembly (I).

2. For the treatment surface control module (TSCM) (H), perform the following:
    a. At the patient head right side, use the phillips head screwdriver to remove the two sems screws (E) that secure the TSCM cover (F) and access door (G) to the manifold assembly (I).
    b. Remove the TSCM cover (F) and access door (G) from the manifold assembly (I).
    c. Disconnect the following connections from the TSCM (H) P.C. board: P2 and P5.
    d. Disconnect the air hose connections from the mattress.

NOTE:
Some force may be necessary to pull the TSCM from the manifold assembly.

    e. Gently pull the TSCM (H) straight out from the manifold assembly (I).

Figure 4-70. Treatment Foot Surface Control Module and Treatment Surface Control Module



Replacement

1. Place the TFSCM (D) or TSCM (H) in the manifold assembly (I).
2. Align the sensor tubes and hoses with the pressure transducer ports, and the reference ports of the manifold assembly (I). Ensure that the hoses get connected to the correct port.

NOTE:
Improper hose connections will result in a fault.

3. Connect the sensor tube (J) to the reference port (K) inside the manifold assembly (I) (see view X).
4. Connect the sensor tube (L) to the reference port (M) inside the manifold assembly (I) (see view X).
5. Firmly push in to fully install and seat the TFSCM (D) or TSCM (H) in the manifold assembly (I).
6. Connect the cable connections.
    a. For the TFSCM (D) P.C. board, connect P1, P2, P5, and P12.
    b. For the TSCM (H) P.C. board, connect P2 and P5.
7. Install the two sems screws (A) or (E) to secure the TSCM cover (F) or TFSCM cover (B) and access door (C) to the manifold assembly (I).
8. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

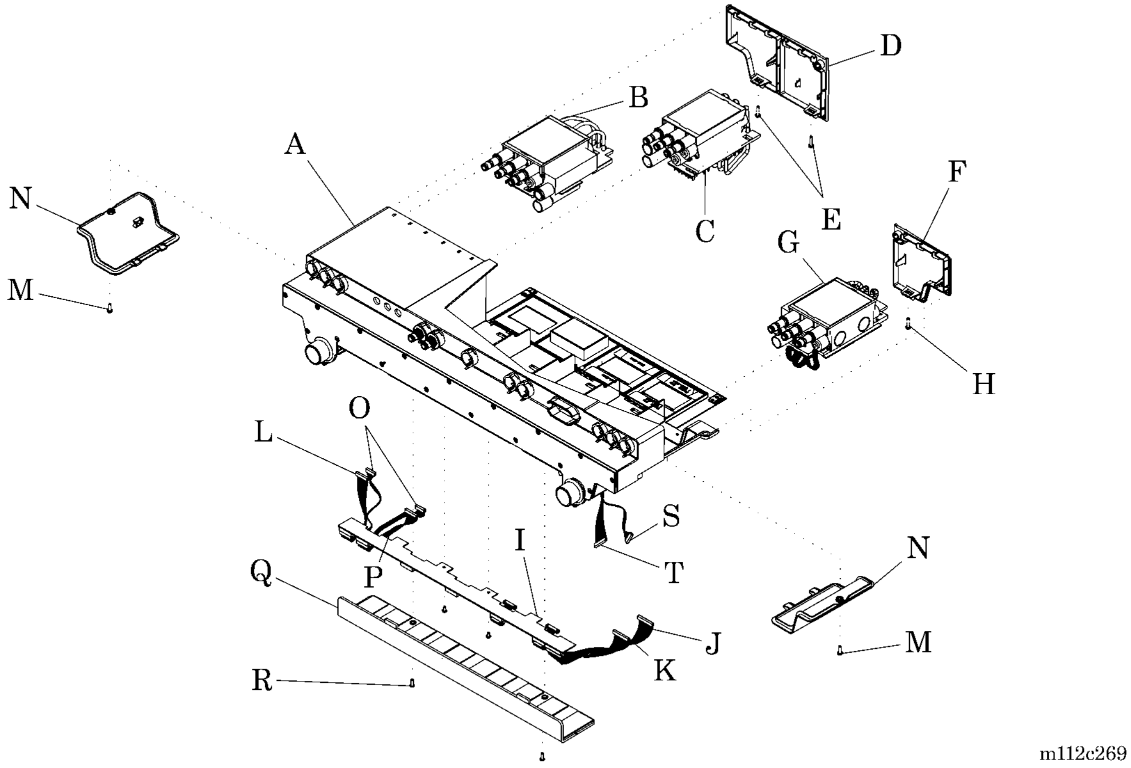
4.61 Treatment Foot Module, Treatment Torso Module, and Pulmonary Base Module, Pulmonary Models

Tools required: T15 Torx®[1] head screwdriver
Phillips head screwdriver

Removal

1. To remove the treatment foot module (TFM) (G), perform the following (see figure 4-71 on page 4-198):

Figure 4-71. Treatment Foot Module, Treatment Torso Module, and Pulmonary Base Module



   a. Using the phillips head screwdriver, remove the screw (M) securing the access door (N) to the manifold assembly (A).
   b. Using the T15 Torx® head screwdriver, remove the screw (H) securing the manifold cover (F) to the manifold assembly (A).
   c. Using the T15 Torx® head screwdriver, remove the two screws (R) from the backplane board cover (Q).

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d. Remove the backplane board cover (Q).
e. Disconnect the 15 pin cable (J) from the TFM (G).
f. Disconnect the 14 pin cable (K) from the TFM (G).
g. Disconnect the 8 pin cable (S) from the TFM (G).
h. Disconnect the 10 pin cable (T) from the TFM (G).
i. Remove the TFM (G) from the manifold assembly (A).

2. To remove the pulmonary base module (PBM) (C), perform the following:
   a. Using the T15 Torx®[1] head screwdriver, remove the screw (M) securing the access door (N) to the manifold assembly (A).
   b. Using the T15 Torx® head screwdriver, remove the two screws (E) securing the manifold cover (D) to the manifold assembly (A).
   c. Using the T15 Torx® head screwdriver, remove the two screws (R) from the backplane board cover (Q).
   d. Remove the backplane board cover (Q).
   e. Disconnect the cable (O) from the PBM (C).
   f. Disconnect the PBM cable (P) from the PBM (C).
   g. Remove the PBM (C) from the manifold assembly (A).
3. To remove the treatment torso module (TTM) (B), perform the following:
   a. Using the phillips head screwdriver, remove the screw (M) securing the access door (N) to the manifold assembly (A).
   b. Using the T15 Torx® head screwdriver, remove the two screws (E) securing the manifold cover (D) to the manifold assembly (A).
   c. Using the T15 Torx® head screwdriver, remove the two screws (R) from the backplane board cover (Q).
   d. Remove the backplane board cover (Q).
   e. Disconnect the cable (O) from the TTM (B).
   f. Disconnect the TTM cable (L) from the TTM (B).
   g. Remove the TTM (B) from the manifold assembly (A).

Replacement

1. To install the TFM (G), perform the following:

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   a. Install the TFM (G) into the manifold assembly (A).
   b. Connect the 14 pin cable (K) to the TFM (G).
   c. Connect the 15 pin cable (J) to the TFM (G).
   d. Connect the 8 pin cable (S) to the TFM (G).
   e. Connect the 10 pin cable (T) to the TFM (G).
   f. Using the T15 Torx®[1] head screwdriver and two screws (R), install the backplane board cover (Q) onto the manifold assembly (A).
   g. Using the T15 Torx® head screwdriver, install the screw (H) and manifold cover (F) onto the manifold assembly (A).
   h. Using the T15 Torx® head screwdriver, install the screw (M) and access door (N) onto the manifold assembly (A).

2. To install the PBM (C), perform the following:
   a. Install the PBM (C) into the manifold assembly (A).
   b. Connect the PBM cable (P) to the PBM (C).
   c. Connect the cable (O) to the PBM (C).
   d. Using the T15 Torx® head screwdriver and two screws (R), install the backplane board cover (Q) onto the manifold assembly (A).
   e. Using the T15 Torx® head screwdriver, install the two screws (E) and manifold cover (D) onto the manifold assembly (A).
   f. Using the phillips head screwdriver, install the screw (M) and access door (N) onto the manifold assembly (A).

3. To install the TTM (B), perform the following:
   a. Install the TTM (B) into the manifold assembly (A).
   b. Connect the TTM cable (L) to the TTM (B).
   c. Connect the cable (O) to the TTM (B).
   d. Using the T15 Torx® head screwdriver and two screws (R), install the backplane board cover (Q) onto the manifold assembly (A).
   e. Using the T15 Torx® head screwdriver, install the two screws (E) and manifold cover (D) onto the manifold assembly (A).
   f. Using the T15 Torx® head screwdriver, install the screw (M) and access door (N) onto the manifold assembly (A).

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4. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-9.

4.62 Treatment Surface

Tools required: None

Removal

NOTE:
Disassemble the sleep surface only to the level necessary.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

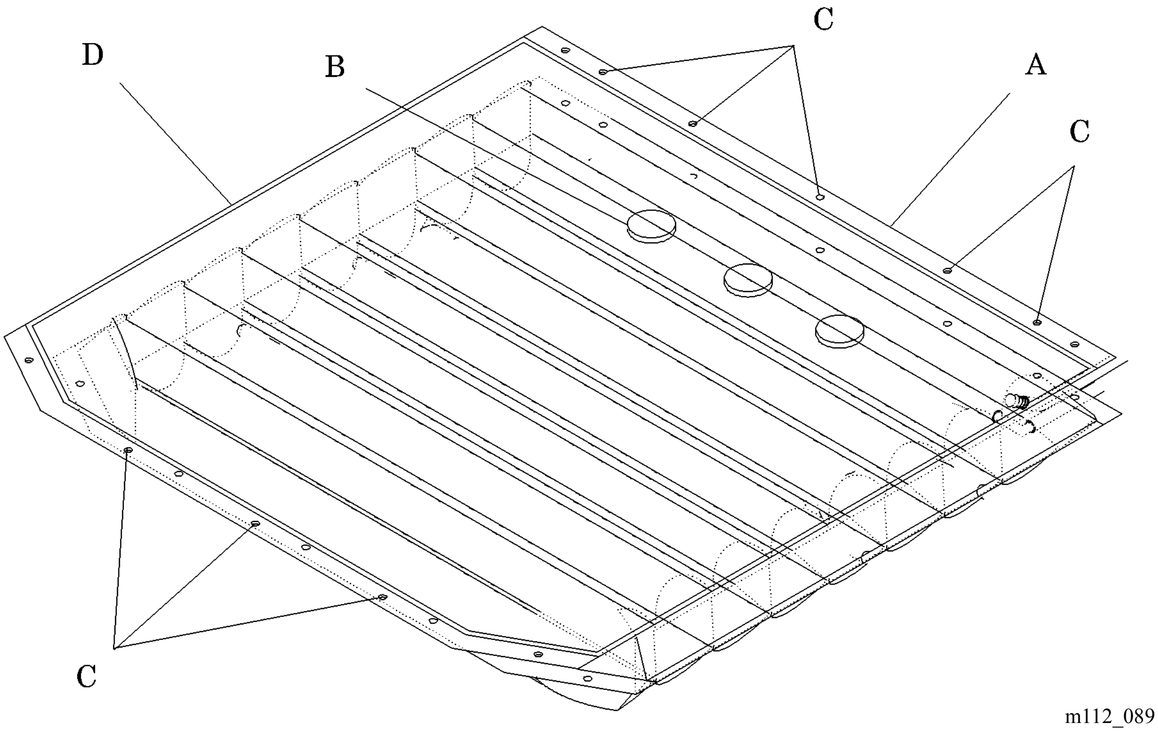
SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Lift the head end of the sleep surface to expose the air hose manifold connections.
4. Depress the air hose connector thumb release, and disconnect each color-coded air hose from the manifold.
5. Unzip the sleep surface ticking from around the head and foot ends of the sleep surface.

NOTE:
Easily remove the O-rings by pulling the fabric up and away from the grooved button.

6. Remove the cloth acrylic fire barrier by removing the rubber O-rings (B) from each of the three grooved buttons located on the head and foot sections (see figure 4-72 on page 4-203).

Figure 4-72. Foot Section



7. Remove the foot air bladder from the thigh bladder by pressing the buttons (C) through the button holes in the thigh bladder.

8. Press the buttons (C) through the button holes in the slip sheet, and remove the slip sheet (D) from the foot air bladder (A).

NOTE:
Hose routing is very important for proper operation of the treatment surface. Improper hose routing can easily result in kinked hoses and bed malfunction.

9. Note and record in detail the routing of all hoses.

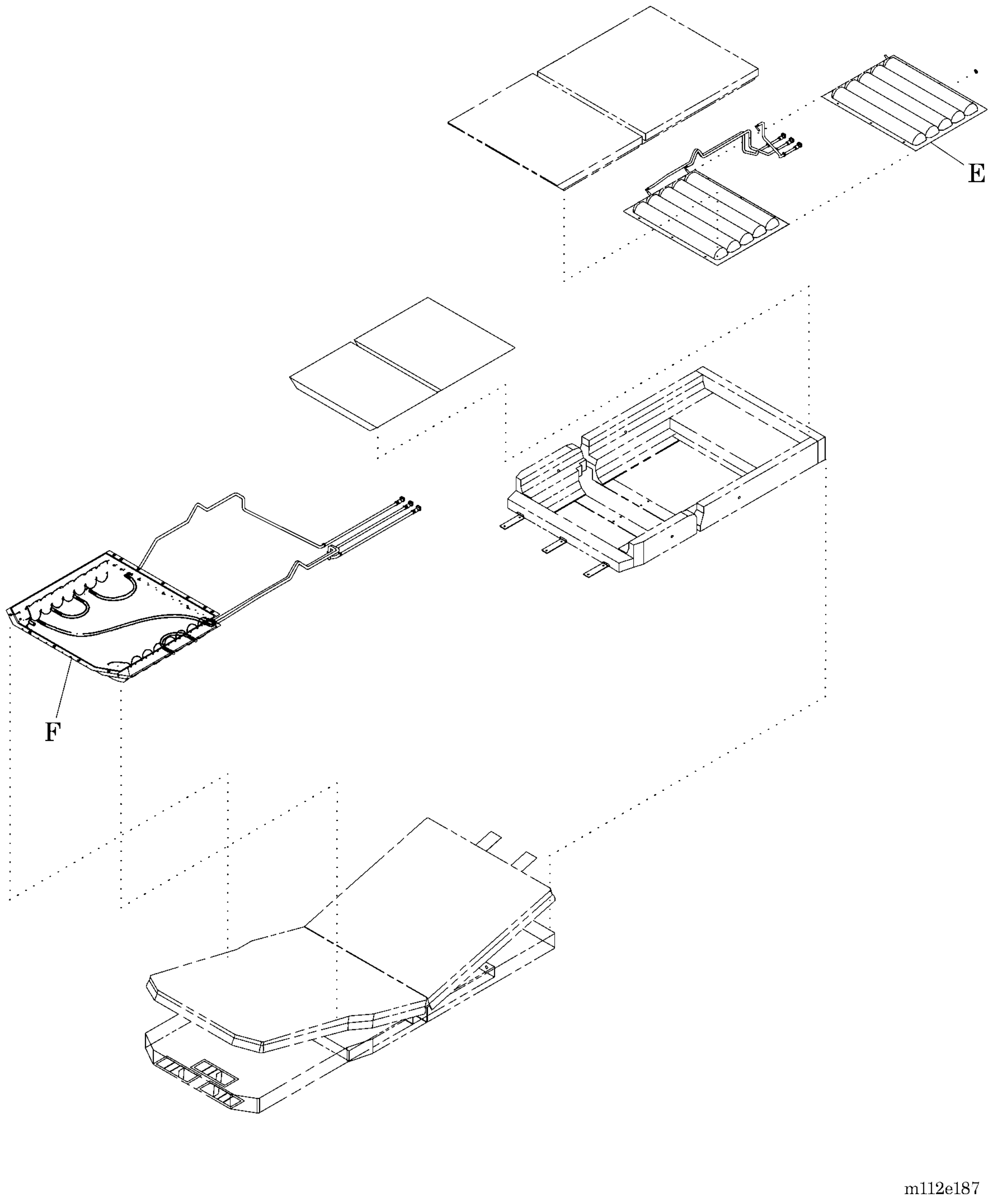
10. Disconnect all air hoses from the head and torso air bladders (E) (see figure 4-73 on page 4-204).

11. Disconnect all air hoses from the foot air bladder (F) (if necessary).

12. Inspect air bladders for staining.

13. Clean the bladder surfaces with disinfectant (see “Cleaning and Care” on page 6-31).

Figure 4-73. Treatment Surface



14. Discard any stained foam.
15. Inflate the bladders, and then feel, listen, or apply soapy water to detect air leaks. Discard any bladders with leaks, and replace them.

Replacement

1. Ensure all sleep surface material is new or properly disinfected prior to assembly.
2. Position the universal foundation to extend approximately 1" (3 cm) beyond the upper edge of the back surface.
3. Perform the removal procedure in reverse order.
4. Route all air hoses to their proper connections. Use extreme care to route the hoses in the same position as noted during the removal procedure.
5. Ensure that the sleep surface components are fully encased in the acrylic fire barrier.
6. Encase the sleep surface in the ticking. Zip the ticking closed.
7. Connect all external sleep surface air hoses to their proper color-coded manifold connections.
8. Plug the bed into an appropriate power source.
9. Partially inflate the treatment surface, and smooth out any bulges by positioning the air bladder sections within their casing.
10. Press the **Max-inflate** control on the caregiver siderail, and verify that the air bladders completely fill, including the foot section.
11. Press the **Chair** caregiver control, and articulate the bed to verify that the treatment surface functions properly throughout both inflate and deflate cycles.
12. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.63 Short Stay Surface

Tools required: None

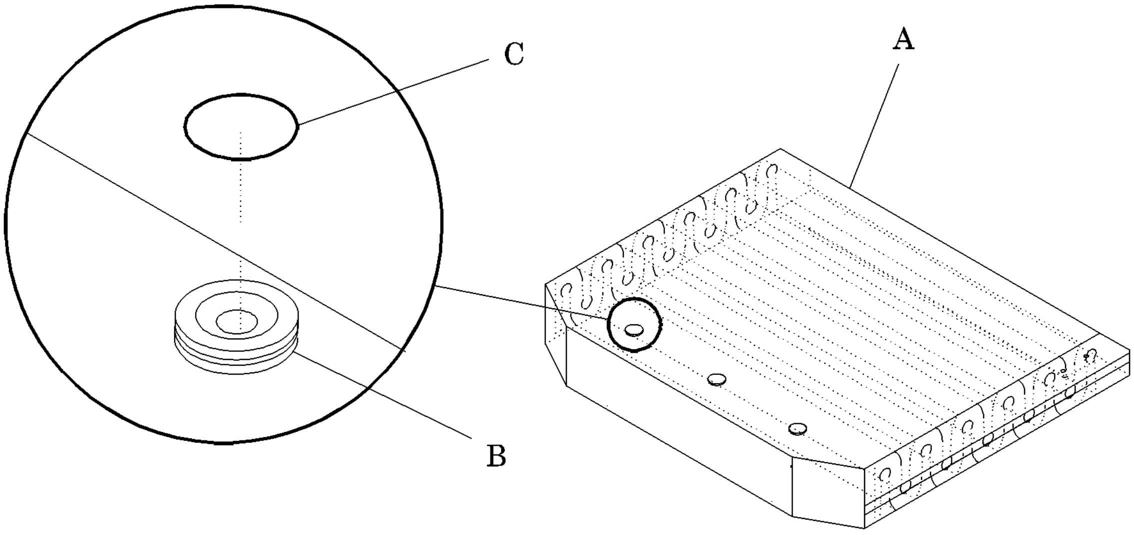
Removal

1. Press the **Bed flat** control to place the bed in the flat position.
2. Press the **Hi-Lo Up** control to raise the bed to the high position.
3. Unzip the sleep surface ticking to gain access to the fire barrier, foam mattress foundations, and pads.

NOTE:
Easily remove the O-rings by pulling the fabric up and away from the grooved button.

4. Remove the cloth acrylic fire barrier by removing the rubber O-rings (C) from each of the three grooved buttons (B) located on the head and foot sections (see figure 4-74 on page 4-206).

Figure 4-74. Fire Barrier O-ring Removal



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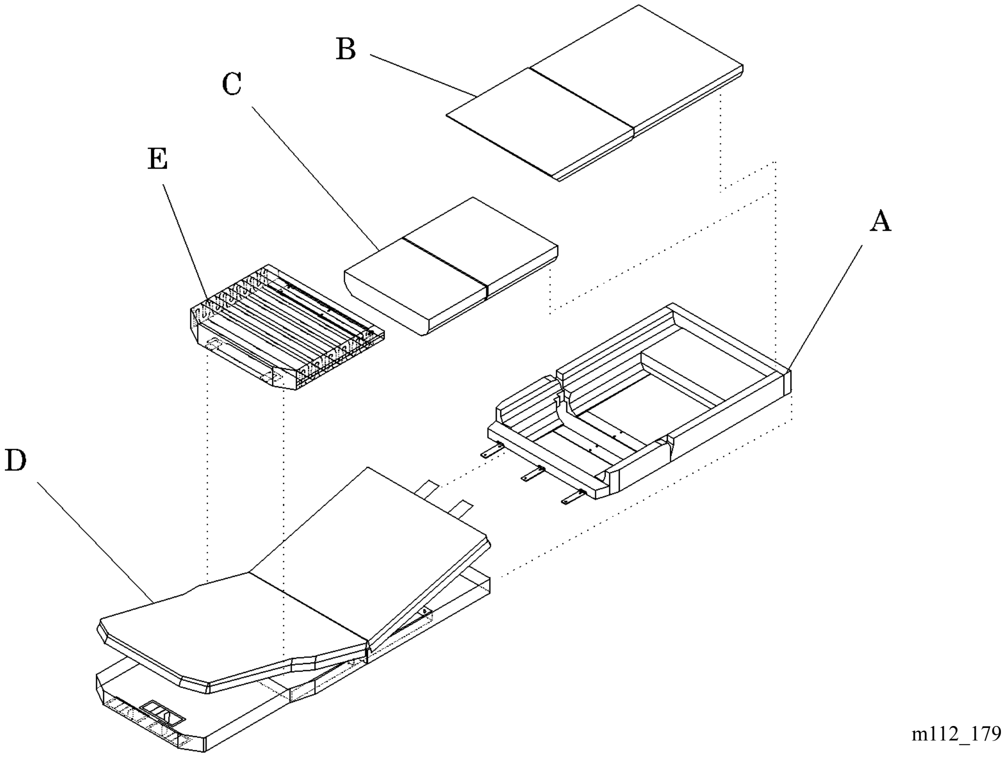
5. Remove the fire barrier from the two plastic fingers located at the sock end of the barrier.

6. Lift the foam mattress pads (B and C) from the foam foundation (A) (see figure 4-75 on page 4-207).

Figure 4-75. Short Stay Surface



7. Check all surfaces of each component for staining.

8. Discard all stained foam.

Replacement

1. Replace all surface stained foam material with new material.

2. Perform the removal procedure in reverse order.

3. Ensure that all of the foam components are fully encased in the acrylic fire barrier.

NOTE:
Be certain to position the "grooved buttons" facing down toward the bed deck, not where they can make contact with the patient.

4. Position and align the sleep surface sections inside the compartments of the frame.

5. Press the **Chair** caregiver control, and articulate the bed to verify that the short stay surface functions properly.

6. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.64 Short Stay Sleep Surface

Tools required: None

Removal

SHOCK HAZARD:
Take care to prevent shearing or pinching of power cords. An electrical shock hazard exists.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).

3. Manually lift up on the foot and head ends of the short stay sleep surface until the magnets (on the foot end) in the ticking material release from the frame.

4. Slide the short stay sleep surface off the bed.

Replacement

1. Place the short stay sleep surface on the bed frame with the narrow end on the foot end of the bed.

2. Plug the unit into an appropriate power source.

3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.65 Treatment Sleep Surface and Pulmonary Sleep Surface

Tools required: None

Removal

SHOCK HAZARD:
Prevent shearing or pinching of power cords. An electrical shock hazard exists.

1. Press the **Enable key** control.
2. Press the **Alarm Silence** control. The Alarm Silence indicator should be off.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Ensure that the safety belts are disconnected.
6. Raise the head end of the bed frame for easier access to the air hose connectors on the manifold assembly.

CAUTION:
Never remove the sleep surface without disconnecting the hoses at the front end of the bed from the manifold assembly. Equipment damage could occur.

7. Disconnect the applicable quick disconnect air hose(s).

NOTE:
Air hoses are color-coded for proper installation identification.

8. Manually lift up on the foot and head ends of the treatment sleep surface until the magnets on the foot end in the ticking material release the sleep surface.

9. Slide the sleep surface off of the bed.

Replacement

1. Place the treatment sleep surface on the bed frame with the air hoses pointing towards the head end of the bed.

NOTE:
All air hoses run underneath the cushions inside the sleep surface.

2. Connect the applicable quick disconnect connectors at the head end of the bed to the manifold assembly. Match the color of air hose with same-colored connector.

3. Plug the unit into an appropriate power source.

4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.66 Pulmonary Surface

Tools required: None

Removal

NOTE:
Disassemble the pulmonary surface only to the level necessary.

1. Using the **Foot In** control, retract the foot section all the way.

NOTE:
Use of the **Foot In** control is not needed if the foot cushion is not being replaced.

2. Raise the bed to the highest position.

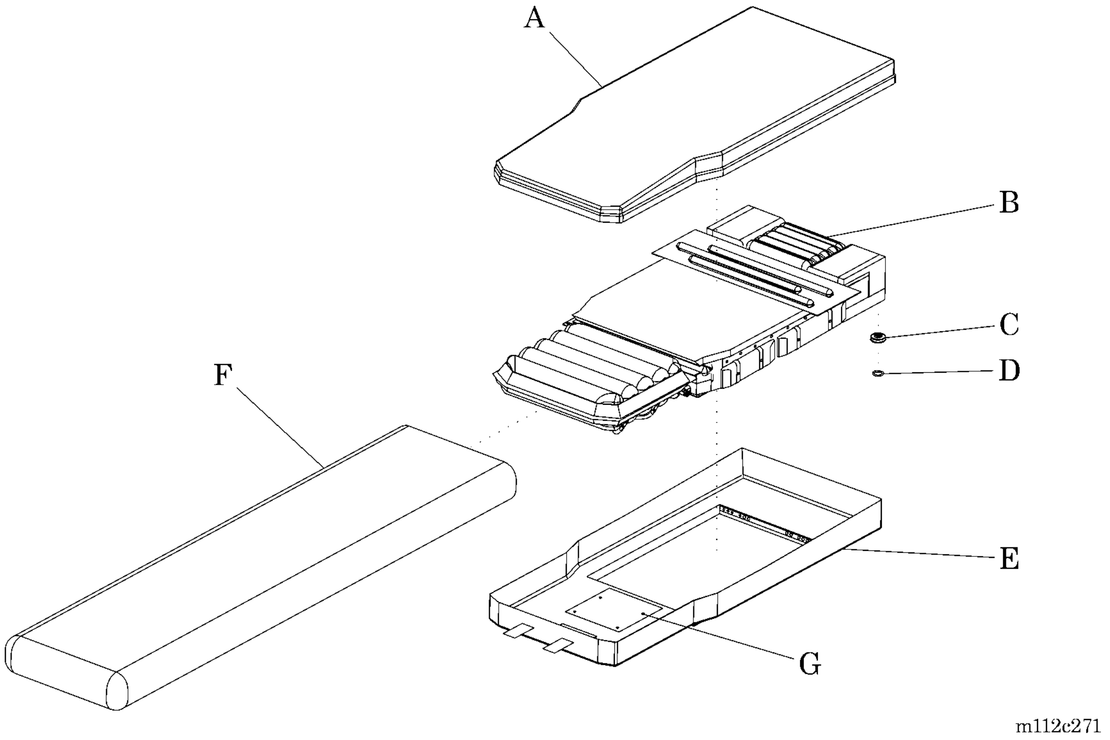
SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Lift the head end of the pulmonary surface to expose the manifold connections.
6. Depress the hose connector thumb release, and disconnect each color-coded air hose from the manifold.
7. Unzip the ticking from around the pulmonary surface.
8. Remove the upper ticking (A) from the mattress (see figure 4-76 on page 4-213).

Figure 4-76. Pulmonary Surface Ticking Removal

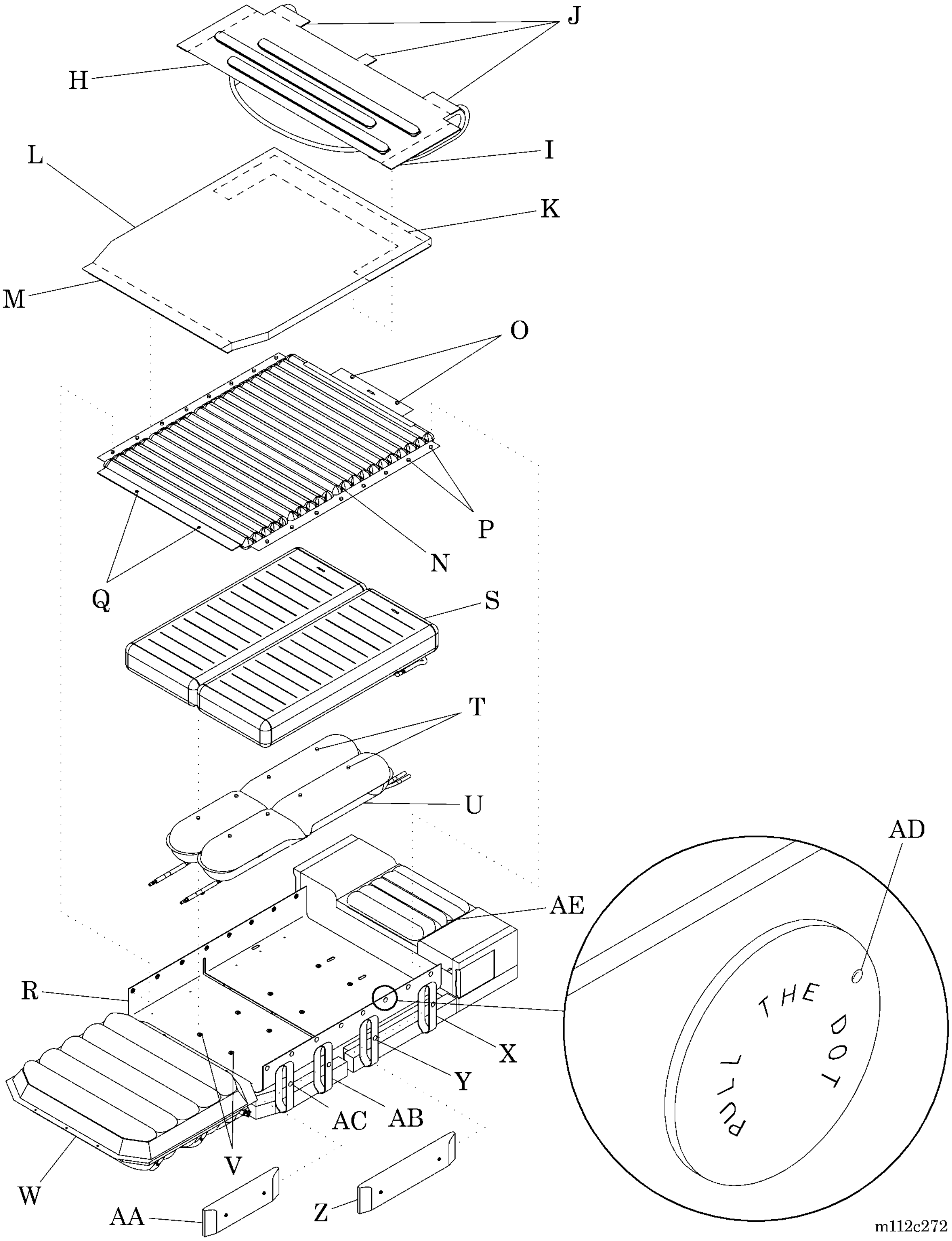


9. Remove the O-ring (D) from around the snap disk (C) at the head end of the fire barrier (F).

CAUTION:
The metal snaps on the mattress are meant to be unsnapped in a certain way. Failure to unsnap the snaps properly can result in equipment damage.

10. When unsnapping the snaps, grasp the snaps in such a way that the side marked with the dimple (AD) is the first side to come loose (see figure 4-77 on page 4-214).

Figure 4-77. Pulmonary Surface Cushion Removal


J
H
I
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T
U
AD
AE
R
X
Y
AC
AB
V
W
AA
Z
PULL THE DOT
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11. Unsnap the four snaps (G) securing the lower ticking (E) to the foot boost bladder (not illustrated) (see figure 4-76 on page 4-213).

12. Remove the fire barrier (F) from the pulmonary surface (B).

⚠ **CAUTION:**
Hose routing is very important for proper operation of the pulmonary surface. Improper hose routing can easily result in kinked hoses or bed malfunction.

13. Note and record in detail the routing of all the hoses.

14. To remove the percussion/vibration cushion (H), perform the following (see figure 4-77 on page 4-214):
    a. Undo the Velcro®[1] (I) on both sides of the percussion/vibration cushion (H), securing it to the topper foam (L).
    b. Undo the Velcro® (J) on the head end of the percussion/vibration cushion (H), securing it to the topper foam (L).
    c. Disconnect the air hoses from the percussion/vibration cushion (H).
    d. Remove the percussion/vibration cushion (H).

15. To remove the topper foam (L), perform the following:
    a. Remove the percussion/vibration cushion (H).

NOTE:
The percussion/vibration cushion air hoses do not need to be disconnected for removal of the topper foam.

    b. Undo the Velcro® (M) at the foot end of the topper foam (L), securing the topper foam (L) to the treatment cushion (N).
    c. Undo the Velcro® (K) at the head end of the topper foam (L), securing the topper foam (L) to the treatment cushion (N).
    d. Remove the topper foam (L).

16. To remove the treatment cushion (N), perform the following:
    a. Remove the percussion/vibration cushion (J).
    b. Remove the topper foam (L).

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[1] Velcro® is a registered trademark of Velcro Industries, BV (a Dutch corporation).

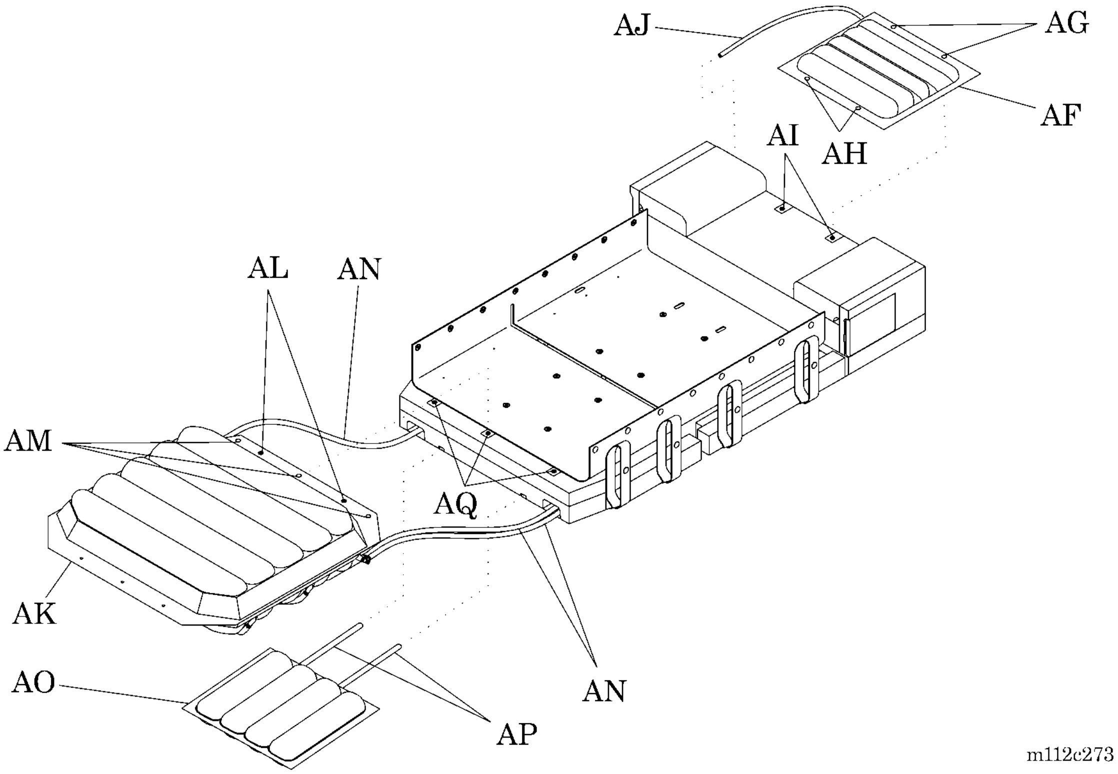
   c. Unsnap the two snaps (Q) at the foot end of the treatment cushion (N), securing the treatment cushion (N) to the foot cushion (W).
   d. On both sides of the treatment cushion (N), unsnap the 16 snaps (P) (eight per side), securing the treatment cushion (N) to the cushion mounting substrate (R).
   e. Unsnap the two snaps (O) at the head end of the treatment cushion (N), securing the treatment surface (N) to the head cushion (AE).
   f. Disconnect the air hoses from the treatment cushion (N).

17. To remove the working cushion (S), perform the following:
   a. Remove the percussion/vibration cushion (H).
   b. Remove the topper foam (L).
   c. Remove the treatment cushion (N).
   d. On both sides of the working cushion (S), at the head end, disconnect the air hose located between the head bolster assembly (Z) and the cushion mounting substrate (R).
   e. For each half of the working cushion (S), unsnap the four snaps (T) securing the working cushion (S) to the torso boost cushion (U).
   f. Remove the working cushion (S).

18. To remove the torso boost cushion (U), perform the following:
   a. Remove the percussion/vibration cushion (H).
   b. Remove the topper foam (L).
   c. Remove the treatment cushion (N).
   d. Remove the working cushion (S).
   e. At the foot end of the torso boost cushion (U), disconnect the air hoses from the torso boost cushion (U).
   f. At the head end of the torso boost cushion (U), disconnect the air hoses from the torso boost cushion (U).
   g. For each torso boost cushion (U), unsnap the four snaps (V) securing the torso boost cushion (U) to the cushion mounting substrate (R).
   h. Remove the torso boost cushion (S).

19. To remove the head cushion (AF), perform the following (see figure 4-78 on page 4-217):

Figure 4-78. Foot and Head Cushion Removal



a. Unsnap the two snaps (AH), securing the head cushion (AF) to the treatment surface (not illustrated).

b. Unsnap the two snaps (AG), securing the head cushion (AF) to the two straps (AI).

c. Disconnect the air hose (AJ) from the head cushion (AF).

d. Remove the head cushion (AF).

20. To remove the foot cushion (AK), preform the following:

a. If the treatment cushion (not illustrated) is installed, unsnap the two **metal** snaps (AL), securing the foot cushion (AK) to the treatment cushion.

b. Unsnap the three **plastic** snaps (AM), securing the foot cushion (AK) to the three straps (AQ).

c. Disconnect the air hoses (AN) from the foot cushion (AK).

d. Remove the foot cushion (AK).

21. To remove the foot boost assembly (AO), perform the following:

   a. If installed, lift the foot cushion (AK) up and out of the way from the foot boost assembly (AO).
   b. Disconnect the air hoses (AP) from the foot boost assembly (AO).
   c. Remove the foot boost assembly (AO).

22. To remove the head bolster assembly (Z), perform the following (see figure 4-77 on page 4-214):
    a. Unsnap the two snaps (Y), securing the head bolster assembly (Z) to the two straps (X).
    b. Slide the head bolster assembly (Z) from inside the two straps (X).

23. To remove the thigh bolster assembly (AA), perform the following:
    a. Unsnap the two snaps (AC), securing the thigh bolster assembly (AA) to the two straps (AB).
    b. Slide the thigh bolster assembly (AA) from inside the two straps (AB).

Replacement

1. Perform the removal procedures in reverse order.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.67 Battery—IntelliDrive® Transport System

Tools required:	T25 Torx®[1] head screwdriver
	¼" box end wrench
	Hilow cylinder braces (SA1695)

Removal

WARNING:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker to the off position. Failure to do so could result in personal injury or equipment damage.

2. On the front of the drive box (E), turn the circuit breaker (A) to the **off** position (see figure 4-79 on page 4-220).
3. Remove the center base cover (refer to procedure 4.3).
4. Install the Hilow cylinder braces (refer to procedure 4.4).
5. Remove the accessory cover (C) from the bottom of the bed.
6. Disconnect the three cables (B) running to the PACM board.
7. Remove the three screws (D) securing the drive box (E) to the bed (F).
8. Disconnect the ground strap (M) from the bed.
9. Slide the drive box (E) toward the patient’s left side of the bed until the batteries (G) are exposed.
10. Remove the two screws (H) securing the retaining bracket (I) to the drive box (E).
11. Remove the retaining bracket (I).
12. Turn the batteries (G) to the vertical position.

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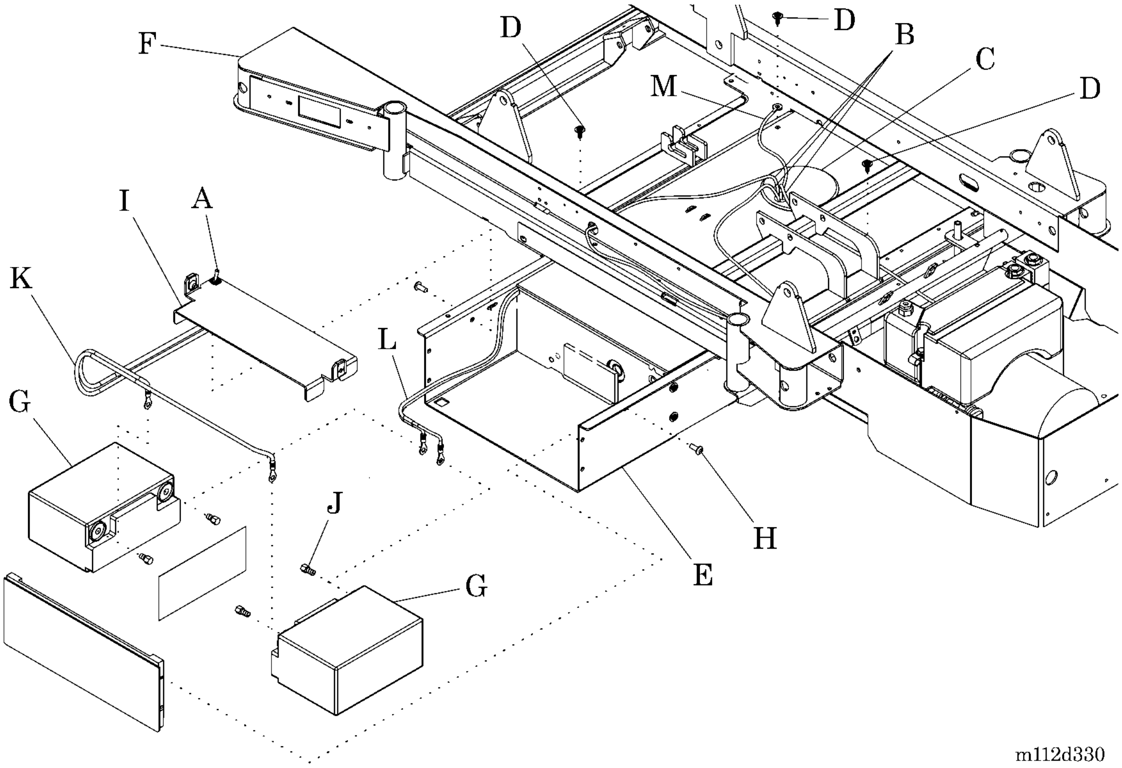
[1] Torx® is a registered trademark of Textron, Inc.

13. Remove the two bolts (J) securing the harnesses (K and L) to the battery (G).

14. Remove the battery (G) from the drive box (E).

Figure 4-79. Battery Removal—IntelliDrive® Transport System



Replacement

1. Perform the removal procedure in reverse order.

WARNING:
Ensure the black wire on the battery is connected to the negative terminal on the battery and the red wire is connected to the positive terminal on the battery. Failure to do can result in personal injury or equipment damage.

2. Connect the black wire to the negative terminal, and the red wire to the positive terminal on the battery.

3. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.68 PACM Board—IntelliDrive® Transport System

Tools required: T25 Torx®[1] head screwdriver
Hilow cylinder braces (SA1695)

Removal

WARNING:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker to the off position. Failure to do so could result in personal injury or equipment damage.

2. On the front of the drive box, turn the circuit breaker to the **off** position.
3. Remove the center base cover (refer to procedure 4.3).
4. Install the hilow cylinder braces (refer to procedure 4.4).
5. Remove the accessory cover (A) from the bottom of the bed (see figure 4-80 on page 4-222).
6. Disconnect the three cables (B) running to the PACM board (D).
7. Disconnect the ground strap (L) from the bed.
8. Remove the three screws (C) securing the drive box (E) to the bed.
9. Slide the drive box (E) to the patient's right side of the bed until the PACM board (D) is exposed.
10. Disconnect the four wires (F) connecting the PACM board (D) to the motor controller (G) from the PACM board (D).
11. Disconnect the motor controller harness (H) from the PACM board (D).
12. Disconnect the linear actuator cable (I) from the PACM board (D).

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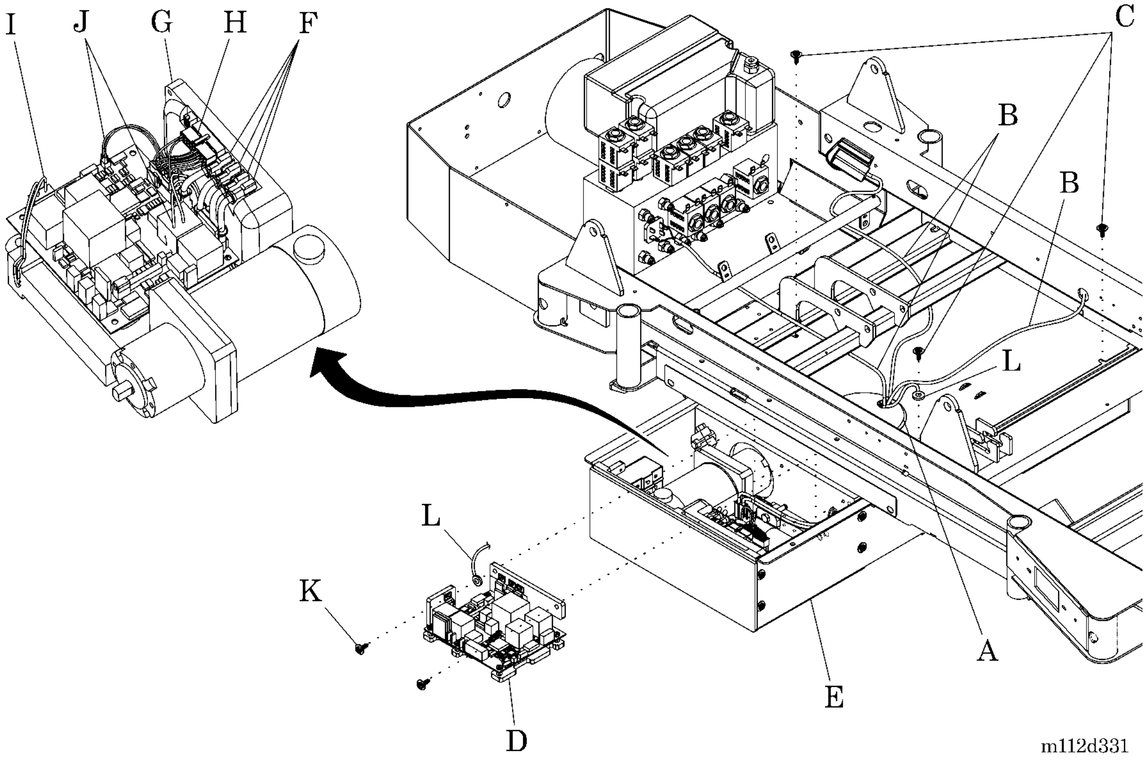
13. Disconnect the two drive motor cables (J) from the PACM board (D).
14. Remove the two screws (K) securing the PACM board (D) to the drive box (E).
15. Remove the PACM board (D) from the drive box (E).

Figure 4-80. PACM Board Removal



Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.69 Drive Motor—IntelliDrive® Transport System

Tools required:	T25 Torx®[1] head screwdriver
	Phillips head screwdriver
	7/16" deep well socket
	Ratchet

Removal

WARNING:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker to the off position. Failure to do so could result in personal injury or equipment damage.

2. On the front of the drive box (E), turn the circuit breaker (A) to the **off** position (see figure 4-81 on page 4-224).
3. Remove the center base cover (refer to procedure 4.3).
4. Install the hilow cylinder braces (refer to procedure 4.4).
5. Remove the accessory cover (B) from the bottom of the bed.

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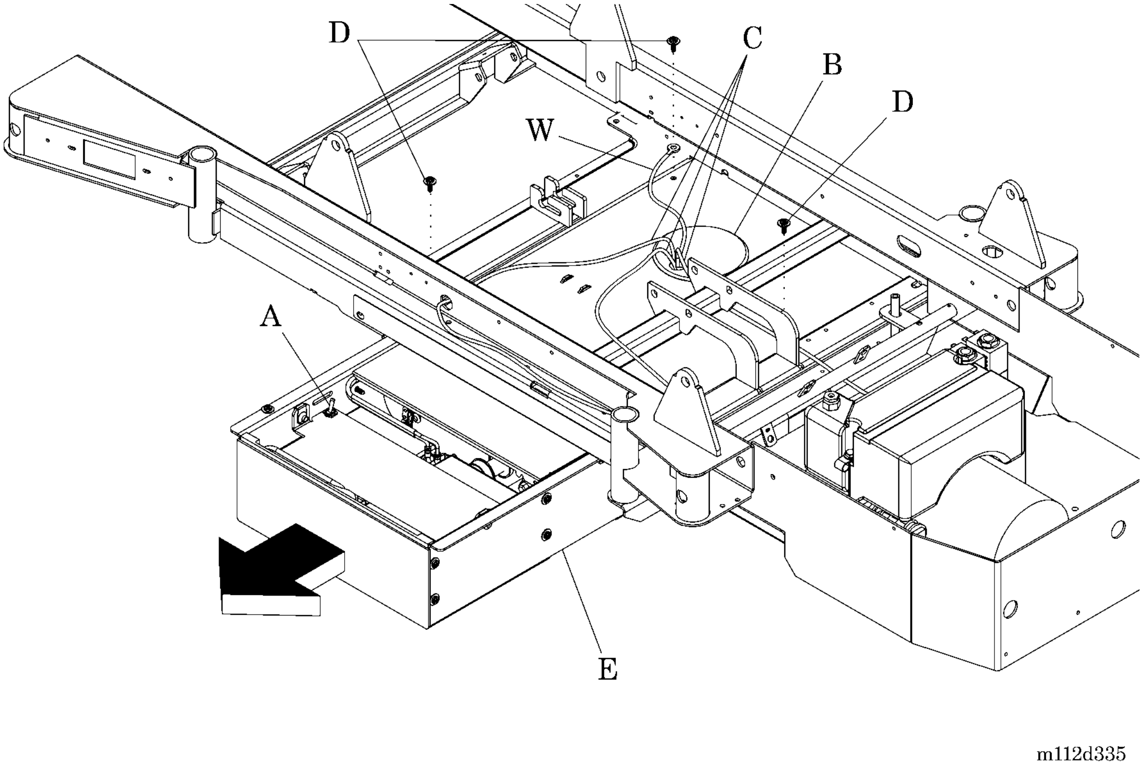
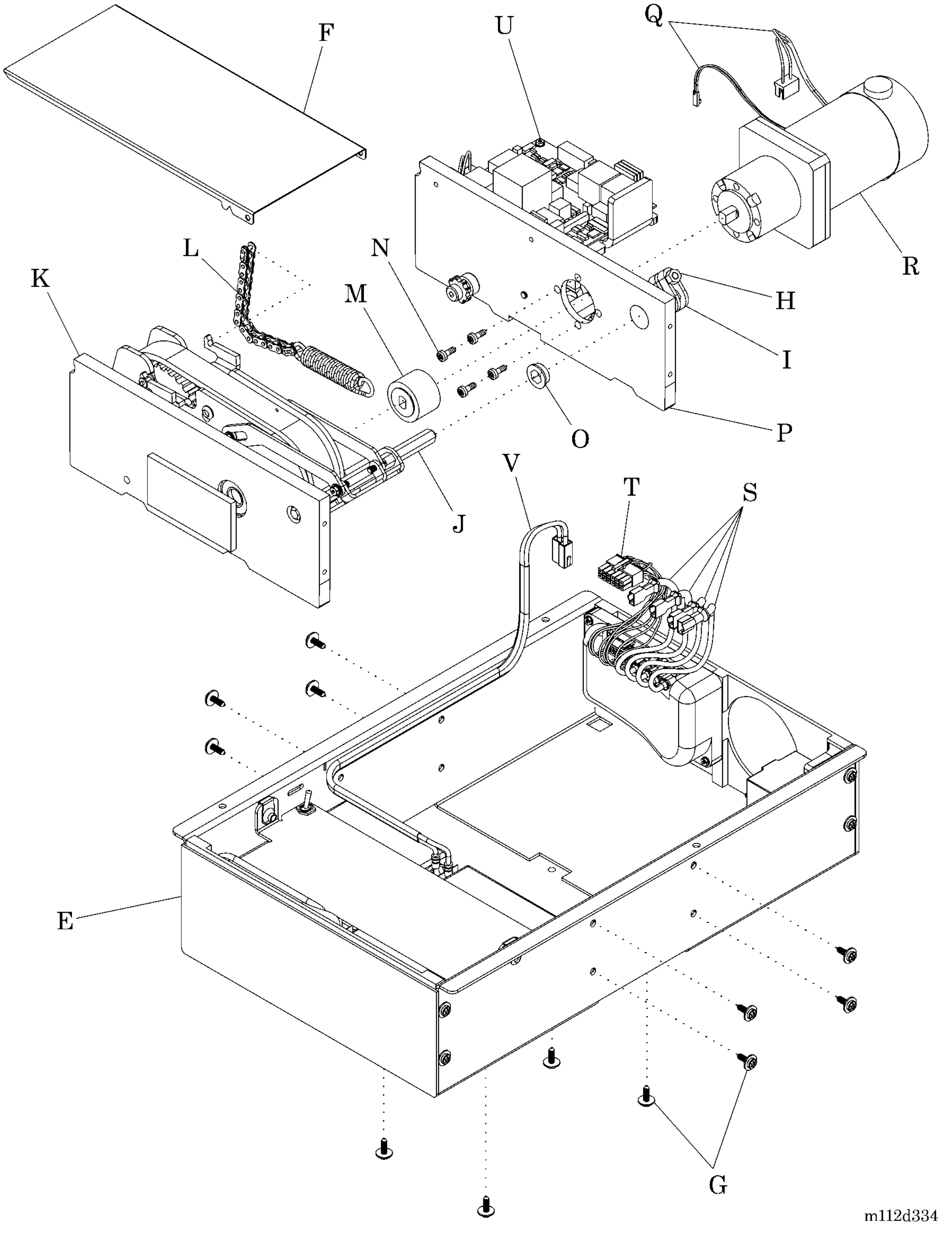
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-81. Drive Box Removal



6. Disconnect the three cables (C) running to the PACM board.
7. Disconnect the ground strap (W) from the bed.
8. Remove the three screws (D) securing the drive box (E) to the bed.
9. Slide the drive box (E) out from under the bed.
10. Disconnect the two drive motor cables (Q) from the PACM board (U) (see figure 4-82 on page 4-225).
11. Disconnect the four controller wires (S) from the PACM board (U).
12. Disconnect the controller harness (T) from the PACM board (U).
13. Disconnect the battery cable (V) from the PACM board (U).
14. Remove the cover (F).

Figure 4-82. Drive Motor Removal


F
U
Q
L
N
K
M
R
H
I
O
P
V
J
T
S
E
G
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15. Remove the 12 screws (G) securing the drive assembly (K) to the drive box (E).

NOTE:
The remaining screws on the box may need to be loosened to allow the drive assembly to be easily removed.

16. Remove the drive assembly (K) from the drive box (E).
17. Loosen the nut (H) on the linear actuator lever (I).
18. Disconnect the linear actuator lever (I) from the drive assembly hex rod (J).
19. Remove the drive assembly (K) from the motor mounting plate (P).
20. Remove the drive motor coupler (M) from the drive motor (R).
21. Remove the plastic bushing (O) from the drive assembly hex rod (J).
22. Remove the chain/spring assembly (L) from the drive unit (K).
23. Remove the four screws (N) securing the drive motor (R) to the motor mounting plate (P).
24. Remove the drive motor (R) from the motor mounting plate (P).

Replacement

1. Perform the removal procedure in reverse order.

NOTE:
The battery end of the drive box goes toward the patients left side of the bed.

NOTE:
The ground strap goes under the screw securing the drive box to the bed.

2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.70 Drive Belt—IntelliDrive® Transport System

Tools required: T25 Torx®[1] head screwdriver
Hilow cylinder braces (SA 1695)

Removal

WARNING:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker to the off position. Failure to do so could result in personal injury or equipment damage.

2. On the front of the drive box (E), turn the circuit breaker (A) to the **off** position (see figure 4-83 on page 4-228).
3. Remove the center base cover (refer to procedure 4.3).
4. Install the hilow cylinder braces (refer to procedure 4.4).
5. Remove the accessory cover (B) from the bottom of the bed.

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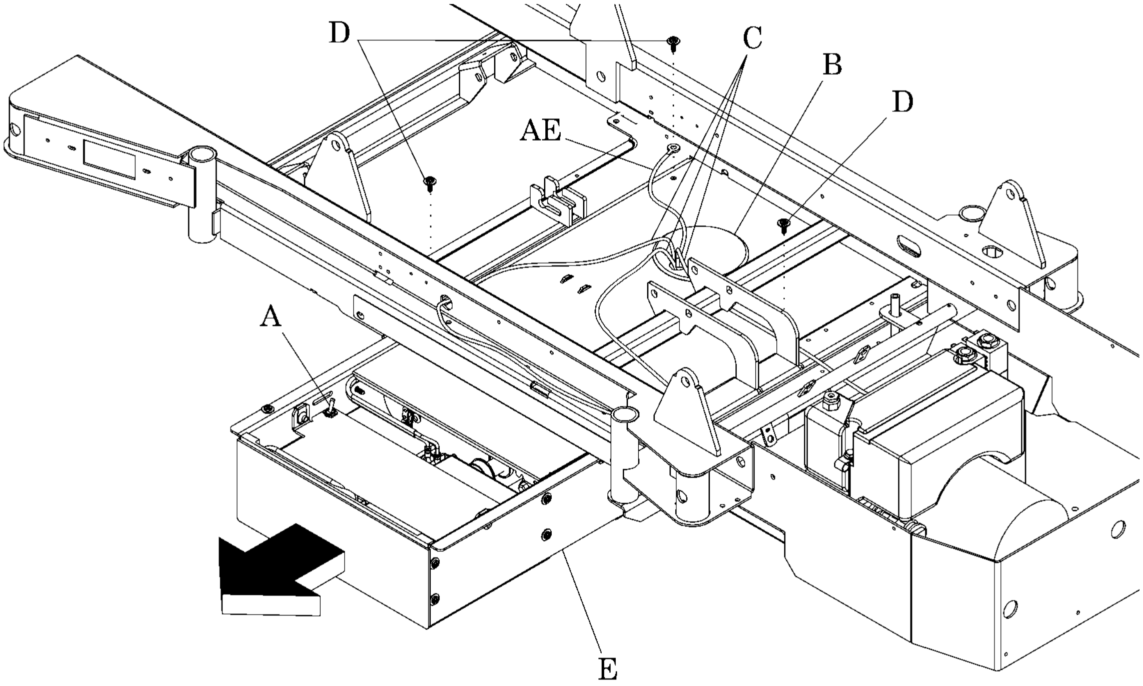
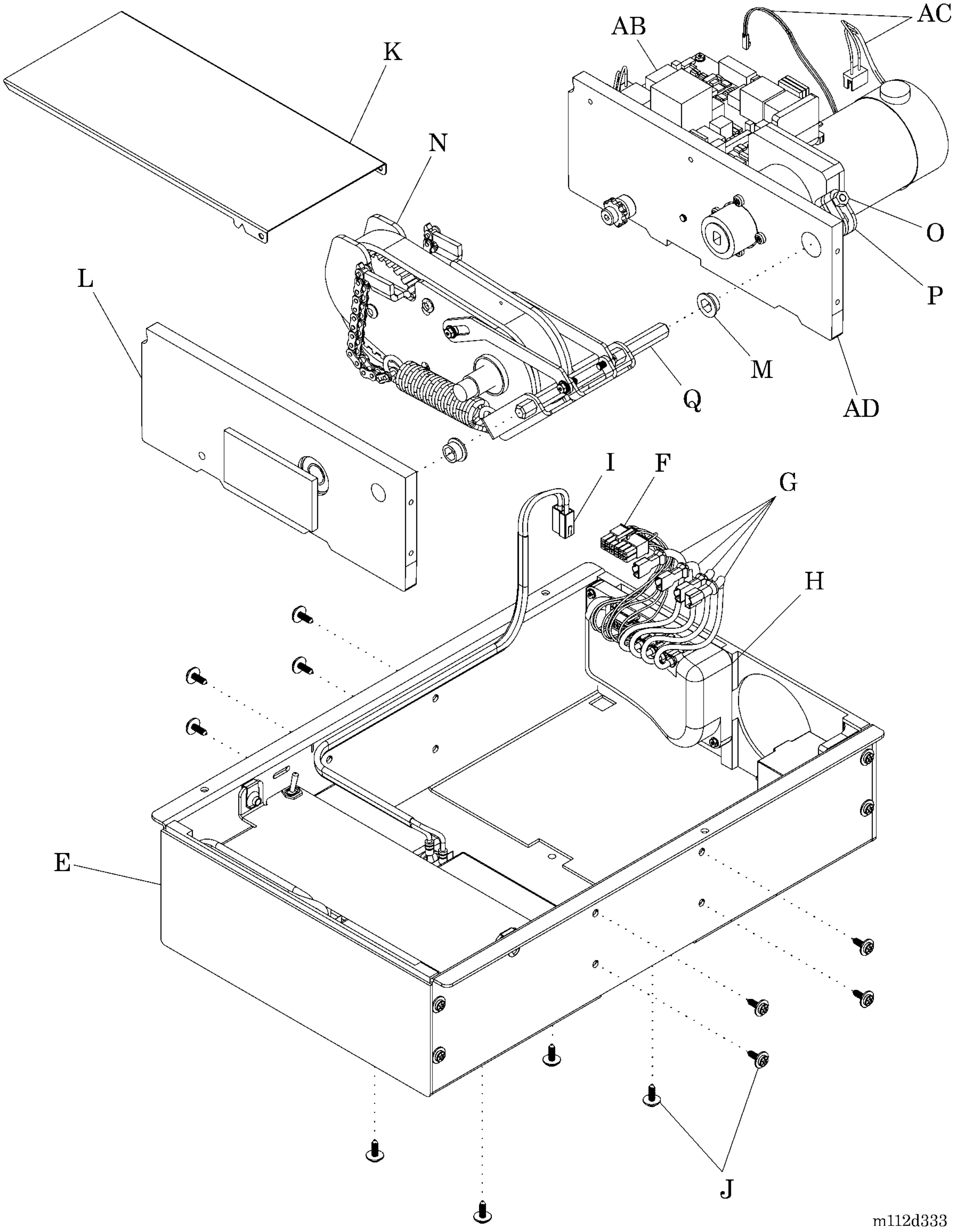
Figure 4-83. Drive Box Removal



6. Disconnect the three cables (C) running to the PACM board.
7. Remove the three screws (D) securing the drive box (E) to the bed.
8. Disconnect the ground strap (AE) from the bed.
9. Slide the drive box (E) out from under the bed.
10. Disconnect the two drive motor cables (AC) from the PACM board (AB) (see figure 4-84 on page 4-229).
11. Disconnect the wires (F, G, and I) from the controller (H) and the PACM board (AB).
12. Remove the cover (K).

Figure 4-84. Drive Unit Removal


AB
AC
K
N
O
L
P
M
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AD
I
F
G
H
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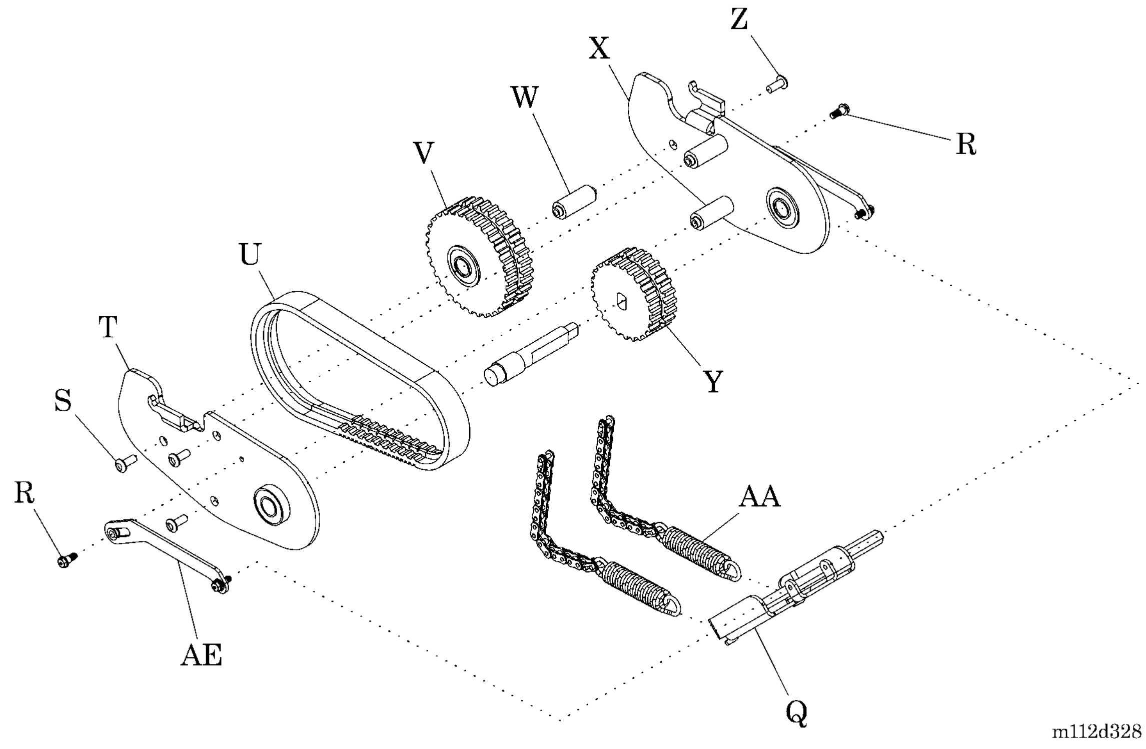
13. Remove the 12 screws (J) securing the drive assembly (N) to the drive box (E).

NOTE:
The remaining screws may need to be loosened to allow the drive assembly to be easily removed.

14. Remove the drive assembly (N) from the drive box (E).
15. Loosen the nut (O) on the linear actuator lever (P).
16. Disconnect the linear actuator lever (P) from the drive assembly hex rod (Q).
17. Remove the drive assembly (N) from the motor mounting plate (AD).
18. Remove the drive plate (L) from the drive assembly (N).
19. Remove the chain/spring assembly (AA) from the plate (Q) (see figure 4-85 on page 4-230).

Figure 4-85. Drive Belt Removal



20. Remove the two screws (R) securing the return links (AE) to the pulley side plates (T and X).
21. Rotate the return links (R) up and out of the way.
22. Remove the three screws (S) securing the left-side pulley plate (T) to the drive assembly.
23. Remove the left-side pulley plate (T).
24. Remove the screw (Z) securing the right-side pulley plate (X) to the pulley shaft (W).
25. Remove the pulley (V) and belt (U) from the drive assembly.
26. Remove the belt from the two pulley’s (V and Y).

NOTE:
Each pulley has a groove running down the middle of it to accept the raised section on the drive belt.

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.71 PAG Board—IntelliDrive® Transport System

Tools required: T25 Torx®[1] head screwdriver
3/8" nut driver

Removal

WARNING:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker to the off position. Failure to do so could result in personal injury or equipment damage.

2. On the front of the drive box, turn the circuit breaker to the **off** position.
3. Remove the two screws (A) securing the cover (B) to the bed (see figure 4-86 on page 4-233).
4. Remove the cover (B) from the bed.
5. Disconnect the cables (not shown) on the PAG board (D).
6. Remove the four nuts (C) securing the PAG board (D) to the bed.

CAUTION:
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

7. Remove the PAG board (D) from the bed.

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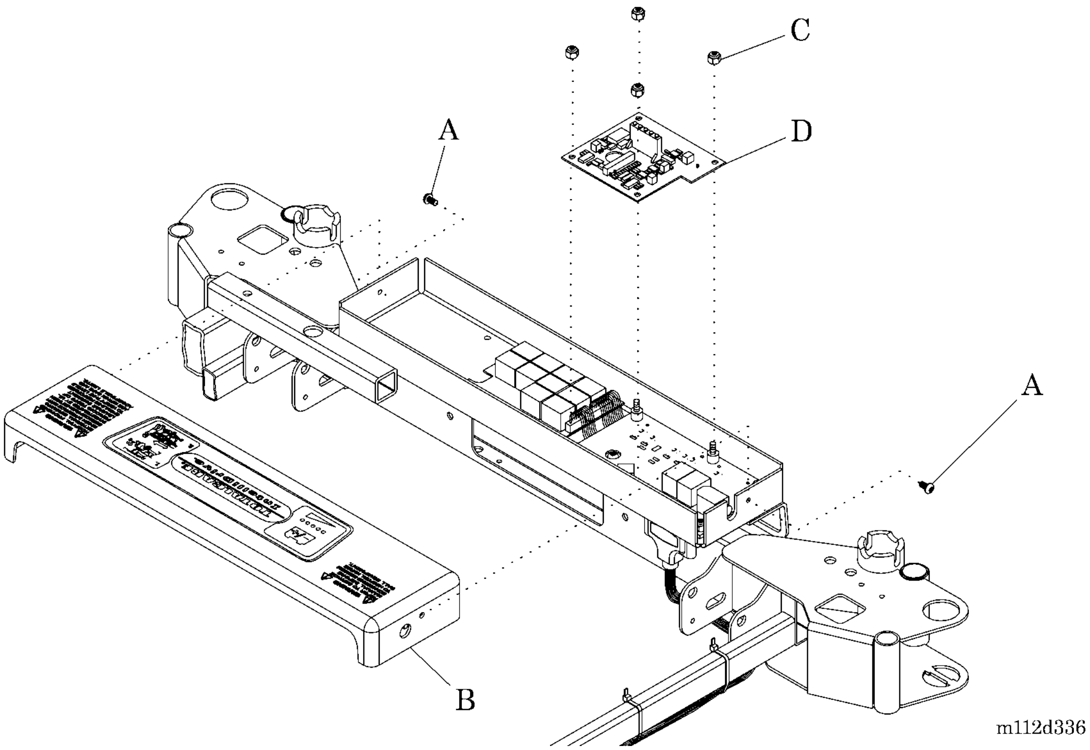
Figure 4-86. PAG Board Removal



Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.72 Siderail Gaskets

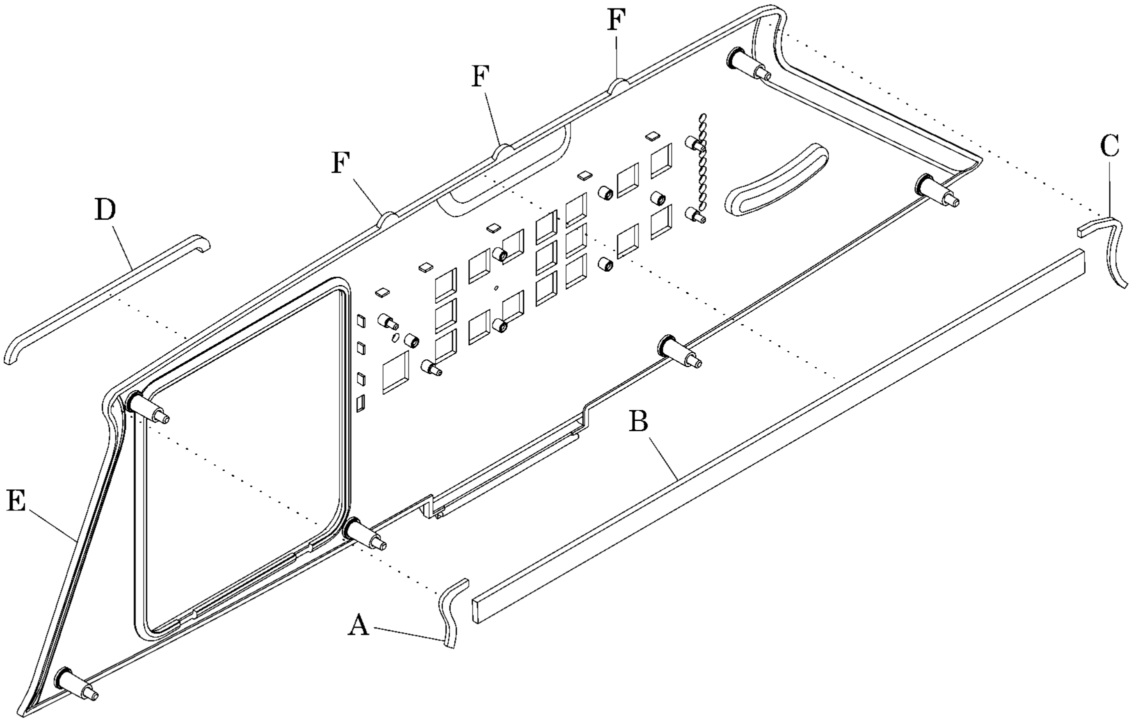
Tools required: T25 Torx®[1] head screwdriver

Installation

Right Intermediate Siderail

1. Remove the right intermediate siderail cover (refer to procedure 4.21).
2. Install the siderail gaskets (A), (B), (C), and (D) by performing the following (see figure 4-87 on page 4-234):

Figure 4-87. Right Intermediate Siderail Gasket Installation



   a. Remove the protective backing from the siderail gasket (A), and place it on the top left corner of the siderail cover (E).
   b. Remove the protective backing from the siderail gasket (B), and place it on the top edge of the siderail cover (E) so it is halfway up the alignment pegs (F).

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c. Remove the protective backing from the siderail gasket (C), and place it on the top right corner of the siderail cover (E), ensuring that there are no gaps between the gaskets (A), (B), and (C).

d. Remove the protective backing from the siderail gasket (D), and place it on the top edge of the Graphical Caregiver Interface (GCI)® Control opening in the siderail cover (E).

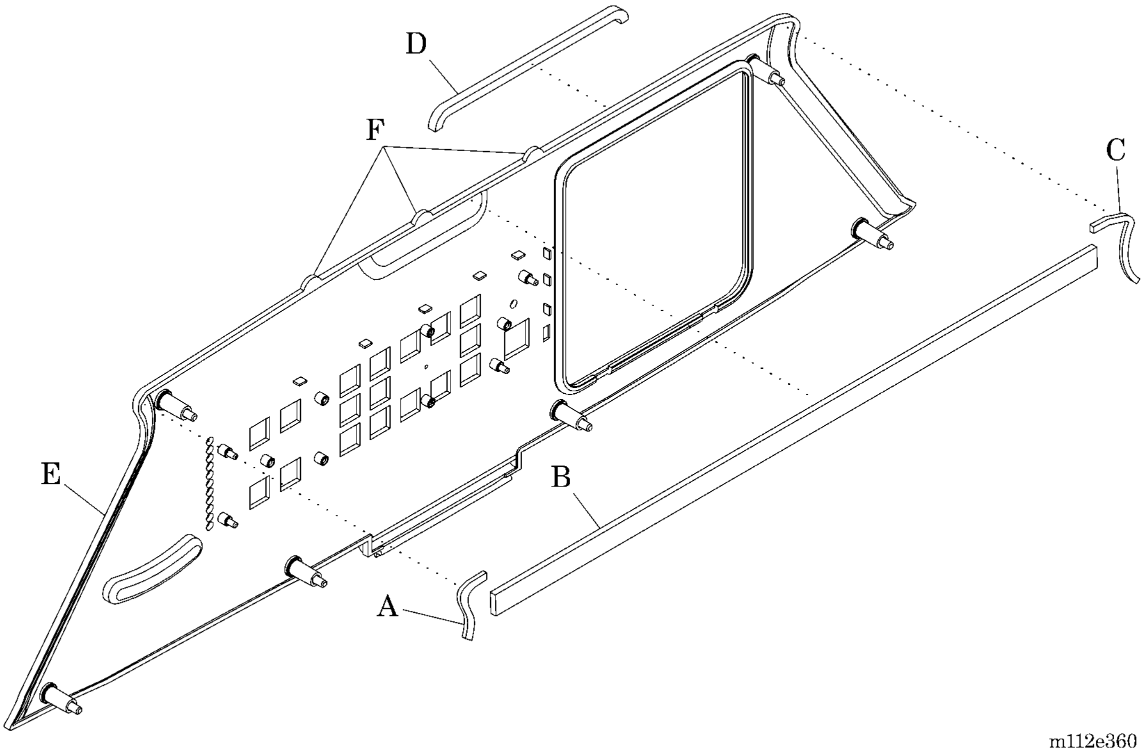
3. Install the right intermediate siderail cover (refer to procedure 4.20).

NOTE:
When the siderail cover is installed, the siderail cover will fold over the top edge of the siderail cover, filling in the area between the siderail cover and the siderail.

Left Intermediate Siderail

1. Remove the left intermediate siderail cover (refer to procedure 4.20).
2. Install the siderail gaskets (A), (B), (C), and (D) by performing the following (see figure 4-88 on page 4-235):

Figure 4-88. Left Intermediate Siderail Gasket Installation



   a. Remove the protective backing from the siderail gasket (A), and place it on the top left corner of the siderail cover (E).
   b. Remove the protective backing from the siderail gasket (B), and place it on the top edge of the siderail cover (E) so it is halfway up the alignment pegs (F).
   c. Remove the protective backing from the siderail gasket (C), and place it on the top right corner of the siderail cover (E), ensuring that there are no gaps between the gaskets (A), (B), and (C).
   d. Remove the protective backing from the siderail gasket (D), and place it on the top edge of the setup control cover opening in the siderail cover (E).

3. Install the left intermediate siderail cover (refer to procedure 4.20).

NOTE:
When the siderail cover is installed, the siderail cover will fold over the top edge of the siderail, filling in the area between the siderail cover and the siderail.

4.73 Transport Handle—IntelliDrive® Transport System

Tools required: T25 Torx®[1] head screwdriver
Wire cutters
7/16" open end wrench
Volt meter
Jewelers screwdriver

Removal

SHOCK HAZARD:
Unplug the bed from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker on the drive box to the **Off** position. Failure to do so could result in personal injury or equipment damage.

2. At the front of the drive box, turn the circuit breaker to the **Off** position.
3. Remove the two screws that secure the SideCom® Communication System cover to the bed, and remove the cover.
4. Cut and remove the cable tie (A) that secures the transport handle cables (B) to the inside of the SideCom® Communication System box (C) (see figure 4-89 on page 4-238).
5. Disconnect the transport handle cables (B) from the PAG P.C. board (D).
6. Cut and remove the cable tie (A) that secures the transport handle cables (B) to the bed (E).
7. Remove the nut (F) and screw (G) that secure the transport handle (H) to the bed (E).
8. Remove the transport handle (H) from the bed (E).

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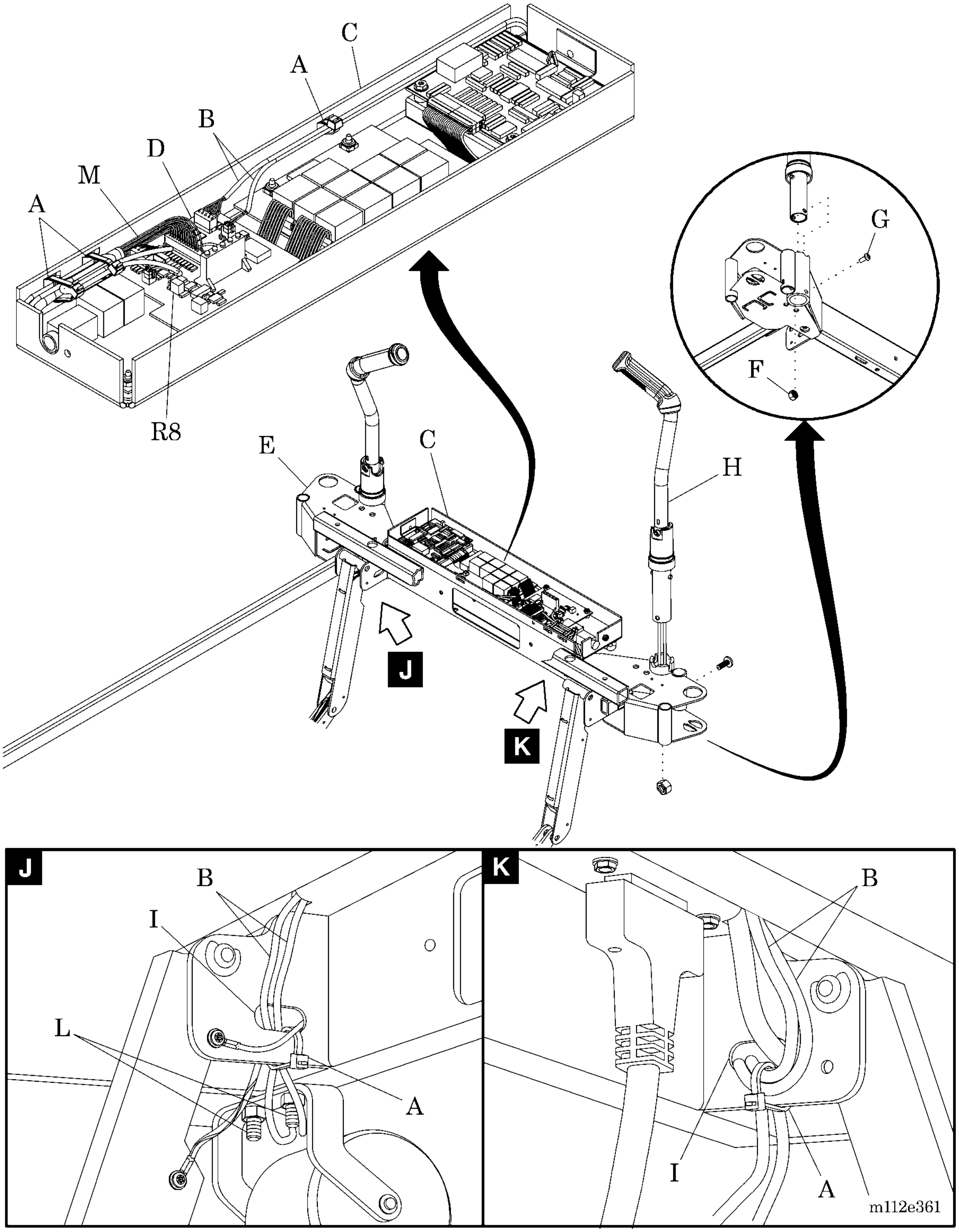
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-89. Transport Handle


C
A
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M
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R8
E
C
G
F
H
J
K
J
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I
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B
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A
m112e361

Replacement

1. Thread the transport handle cables (B) of the new transport handle (H) through the bed (E).
2. Install the transport handle (H) on the bed (E).
3. Align the mounting hole in the transport handle (H) with the hole in the bed (E).
4. Install the nut (F) and screw (G) through the bed (E) into the transport handle (H).

NOTE:
For easier access to the nut, position the wrench through the roller bumper bracket to grab hold of the nut.

5. Stow the transport handle (H).
6. Route the transport handle cables (B) through the bed frame slot (I) and up toward the SideCom® Communication System box (C) (see view J or K).
7. Route and connect the transport handle cables (B) to the PAG P.C. board (D):
   - Connect the enable switch cable (two-pin) to connector **P5** on the PAG P.C. board (D).
   - Connect the strain gauge cable (five-pin) to connector **P2** on the PAG P.C. board (D).

⚠ **CAUTION:**
Ensure that there is sufficient slack in the transport handle cables to enable them to pass over the roller bumper mounting bolts during raising and lowering of the transport handles. Failure to do so could result in equipment damage.

8. Ensure that there is sufficient slack in the transport handle cables (B) to enable them to pass over the roller bumper bolts (L) (see view J).
9. Using a cable tie (A), secure the transport handle cables (B) to the bed frame slot (I) (see view J or K).
10. Raise the transport handle (H). Ensure that the transport handle cables (B) do **not** rest on the roller bumper bolts (L) (see view J).

11. Using a cable tie (A), secure the transport handle cables (B) to the SideCom® Communication System box (C).

12. When installing a **left-hand** transport handle (H), fold **only** the ends of the left transport handle cables (B) over approximately 3" (8 cm) three times.

13. Ensure that the PAG-to-PACM P.C. board cable (M) is under the left transport handle cables (B) inside the SideCom® Communication System box (C).

14. Using two cable ties (A), secure the transport handle cables (B) and the PAG-to-PACM P.C. board cable (M) to the SideCom® Communication System box (C).

15. Using a common ground, ensure that the voltage on the PAG P.C. board (D) at **P6**, pin 1, is between 2.49V DC and 2.51V DC. If necessary, adjust **R8**.

16. Install the two screws to secure the SideCom® Communication System cover to the bed.

17. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.74 Motor Controller—IntelliDrive® Transport System

Tools required: T25 Torx®[1] head screwdriver
Hilow cylinder braces—SA1695
T15 Torx® head screwdriver

Removal

SHOCK HAZARD:
Unplug the bed from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

WARNING:
Turn the circuit breaker on the drive box to the **Off** position. Failure to do so could result in personal injury or equipment damage.

2. At the front of the drive box, turn the circuit breaker to the **Off** position.
3. Remove the center base cover (refer to procedure 4.3).
4. Install the hilow cylinder braces (refer to procedure 4.4).
5. Remove the accessory cover (A) from the bottom of the bed (B) (see figure 4-90 on page 4-242).

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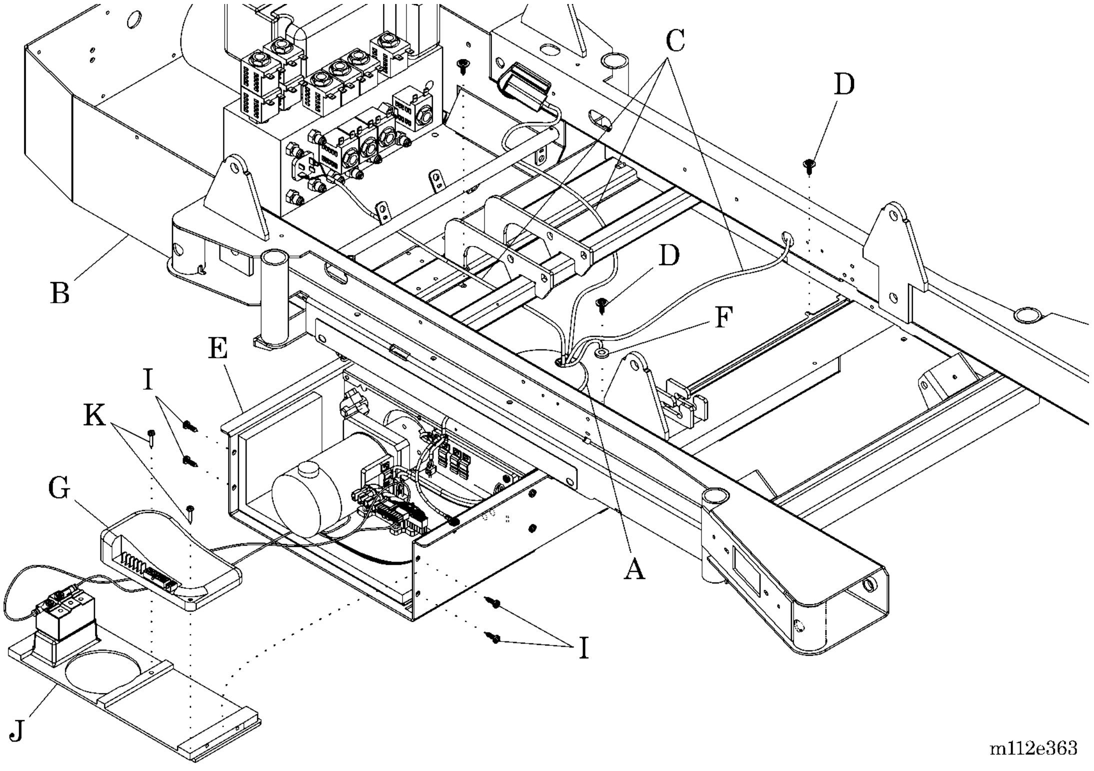
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-90. Motor Controller



6. Disconnect the three cables (C) running to the PACM P.C. board.
7. Remove the three screws (D) that secure the drive box (E) to the bed (B).
8. Disconnect the ground strap (F) from the bed (B).
9. Slide the drive box (E) toward the patient's right side of the bed until the motor controller (G) is exposed.
10. Disconnect the wires from the motor controller (G).
11. Remove the four screws (I) that secure the end plate (J) to the drive box (E).
12. Remove the end plate (J) from the drive box (E).

NOTE:
There is no need to disconnect the wires from the override switch in the end plate.

13. Remove the two screws (K) that secure the motor controller (G) to the end plate (J).

Replacement

1. Perform the removal procedure in reverse order.
2. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

4.75 Siderail Control Cable

Tools required: T25 Torx®[1] head screwdriver
T10 Torx® head screwdriver
Tape measure
Marking pen
String
Needle nose pliers
Antistatic wrist strap

Removal

1. Set the brakes on the bed.
2. Raise the bed to its highest position.

SHOCK HAZARD:
Unplug the bed from its power source. Failure to do so could result in personal injury or equipment damage.

3. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

4. Disable the battery (refer to procedure 6.1).
5. Remove the cover (A) from the center arm (B) from one of the intermediate siderails (C) (see figure 4-91 on page 4-245).

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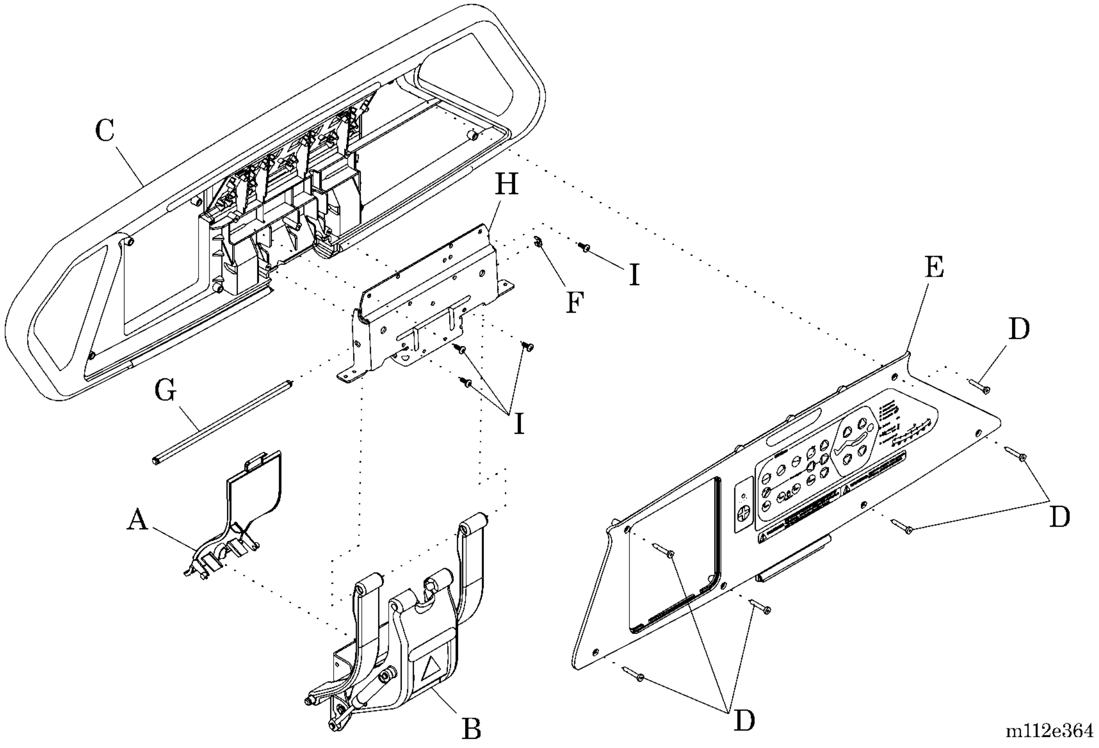
[1] Torx® is a registered trademark of Textron, Inc.

Figure 4-91. Siderail



6. Raise the siderail (C) to the up and locked position.

CAUTION:
Put on the antistatic wrist strap. Failure to do so could result in equipment damage.

7. Put on the antistatic wrist strap, and connect it to a ground strap on the bed frame.

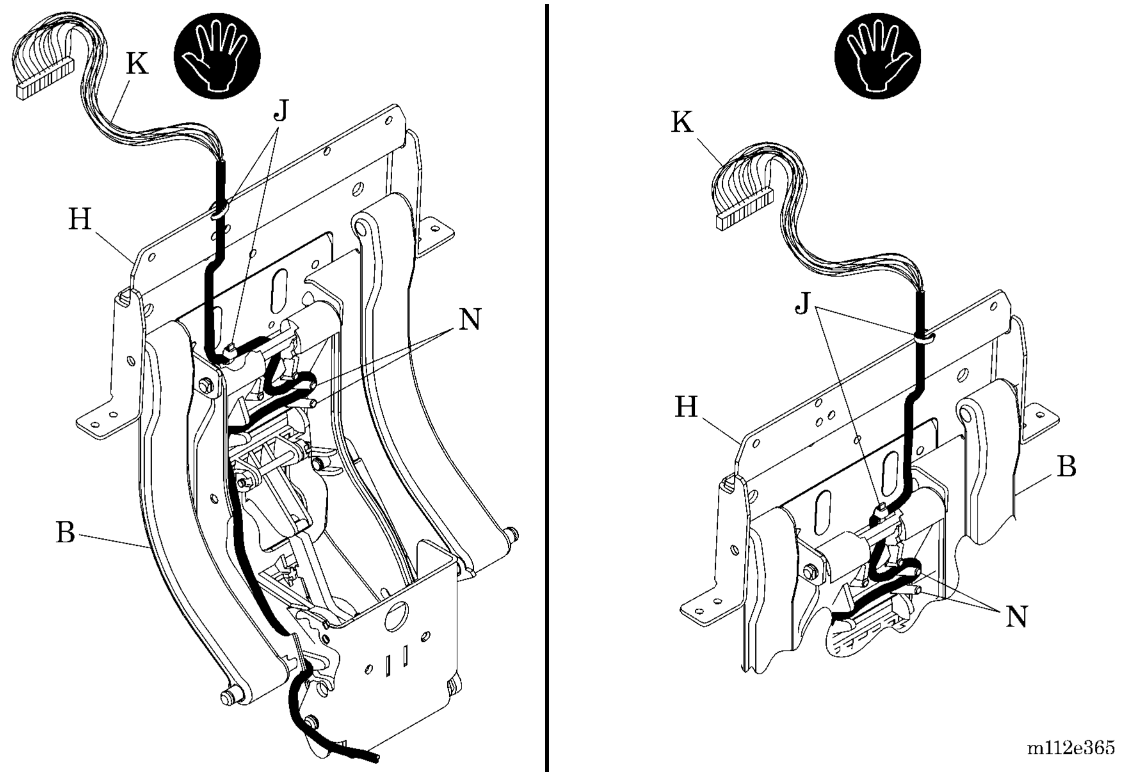
8. Perform **one** of the following:
    - On a **right-hand** siderail, remove the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26).
    - On a **left-hand** siderail, remove the sleep surface control panel (refer to procedure 4.25).

9. Remove the six screws (D) that secure the siderail cover (E) to the siderail (C).

10. Remove the siderail cover (E) from the siderail (C).

11. Carefully disconnect all of the cables from the siderail cover (E).
12. Remove the E-ring (F) that secures the D-pin (G) to the bracket (H).
13. Remove the D-pin (G) from the bracket (H).
14. Remove the four screws (I) that secure the siderail (C) to the bracket (H).
15. Remove the siderail (C).
16. Cut and remove the two cable ties (J) that secure the siderail cable (K) to the bracket (H) (see figure 4-92 on page 4-246).

Figure 4-92. Siderail Cable



17. On a **right-hand** siderail (C) only (see figure 4-91 on page 4-245), cut and remove the cable tie (J) that secures the siderail cable (K) and siderail detection switch cable, if installed, to the bed frame (see figure 4-92 on page 4-246).
18. Remove the siderail cable (K) from the center arm (B).
19. Disconnect the siderail cable (K) from the weigh frame P.C. board.

20. Tie the string around the end of the siderail cable (K) at the weigh frame P.C. board.

NOTE:
During installation of the new siderail cable, the string acts as a pull string.

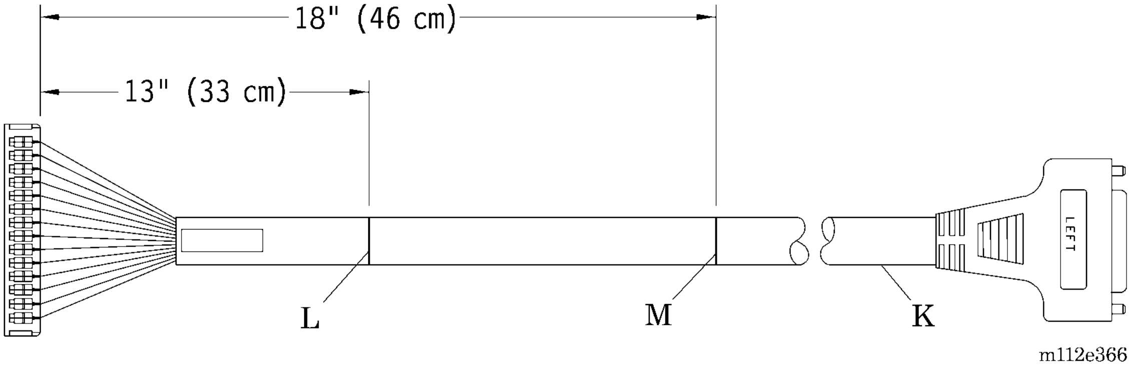
21. Remove the siderail cable (K) from the bed.

22. Remove the string from the end of the siderail cable (K).

Replacement

1. On a **left-hand** siderail cable (K) only, perform the following (see figure 4-93 on page 4-247):

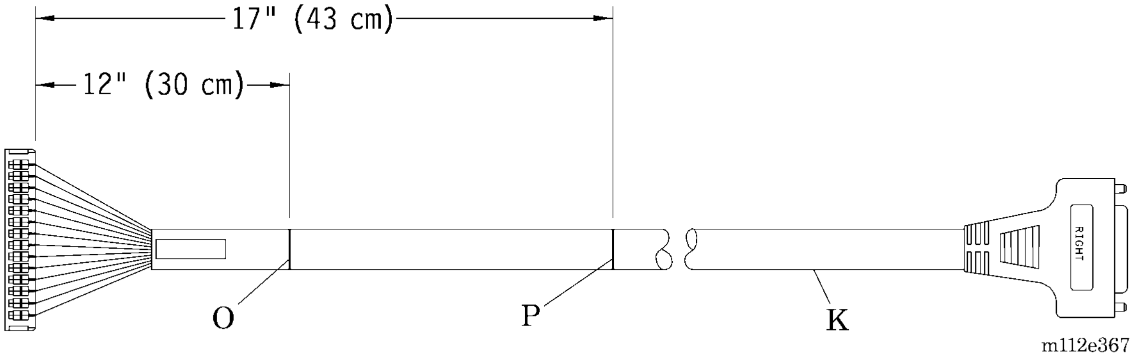
Figure 4-93. Left-Hand Siderail Cable Markings



   a. Mark the siderail cable (K) at 13" (33 cm) and 18" (46 cm) from the siderail P.C. board connector end of the siderail cable (K).
   b. Route the P.C. board connector end of the new siderail cable (K) under the D-pin (G) at the top of the center arm (B) (see figure 4-91 on page 4-245).
   c. Using a cable tie (J) (see figure 4-92 on page 4-246) at the 13" (33 cm) mark (L) (see figure 4-93 on page 4-247), secure the siderail cable (K) to the bottom of the bracket (H) (see figure 4-92 on page 4-246).
   d. Route the siderail cable (K) to the bottom of the center arm (B) (see figure 4-92 on page 4-246) so the 18" (46 cm) mark (M) (see figure 4-93 on page 4-247) is between the two posts (N) in the center arm (B) (see figure 4-92 on page 4-246).
   e. Route the siderail cable (K) to the hole in the cable trough on the underside of the bed frame.

2. On a **right-hand** siderail cable (K) only, perform the following (see figure 4-94 on page 4-248):

Figure 4-94. Right-Hand Siderail Cable Markings



a. Mark the siderail cable (K) at 12" (30 cm) and 17" (43 cm) from the siderail P.C. board connector end of the siderail cable (K).

b. Route the P.C. board connector end of the new siderail cable (K) under the D-pin (G) at the top of the center arm (B) (see figure 4-91 on page 4-245).

c. Using a cable tie (J) (see figure 4-92 on page 4-246) at the 12" (30 cm) mark (O) (see figure 4-94 on page 4-248), secure the siderail cable (K) to the bottom of the bracket (H) (see figure 4-92 on page 4-246).

d. Route the siderail cable (K) to the bottom of the center arm (B) (see figure 4-92 on page 4-246) so the 17" (43 cm) mark (P) (see figure 4-94 on page 4-248) is between the two posts (N) in the center arm (B) (see figure 4-92 on page 4-246).

e. Route the siderail cable (K) down the center arm (B) to the bed frame.

f. Route the siderail cable (K) under the center arm (B) toward the head end of the bed.

g. Route the siderail cable (K) to the hole in the cable trough on the underside of the bed frame.

h. At the cable tie mount, secure the siderail cable (K) and siderail detection switch cable to the bed frame.

3. Tie the string to the end of the new siderail cable (K), and pull the string through the cable trough to route the new siderail cable (K) in the bed.

4. Connect the new siderail cable (K) to the weigh frame P.C. board.

5. Using a cable tie (J), secure the siderail cable (K) to the top of the bracket (H) so the siderail cable (K) points toward the head end of the bed.

6. Place the siderail (C) next to the bracket (H) (see figure 4-91 on page 4-245).

⚠ **CAUTION:**
When installing the screws, ensure that the siderail is tight against the bracket. Failure to do so could result in gaps between the bracket and the siderail, preventing proper operation of the siderail.

7. Ensuring that the siderail (C) is tight against the bracket (H), install the four screws (I) that secure the siderail (C) to the bracket (H).

NOTE:
The bracket is tapped for screws. If the siderail is **not** tight against the bracket, the screws could bottom out before the siderail is properly secured.

⚠ **CAUTION:**
When handling electronic components, wear an antistatic strap. Failure to do so could result in component damage.

8. Put on the antistatic wrist strap, and connect it to a ground strap on the bed frame.

9. Place the siderail cover (E) next to the siderail (C).

10. Connect the siderail cables (K) to the P.C. board (see figure 4-92 on page 4-246).

11. Install the six screws (D) to secure the siderail cover (E) to the siderail (C) (see figure 4-91 on page 4-245).

12. Install the cover (A) on the center arm (B).

13. Raise and lower the siderail (C) twice to ensure proper operation of the siderail (C).

14. Ensure that the siderail cable (K) is **not** pinched (see figure 4-92 on page 4-246). Repair as necessary.

15. Perform **one** of the following:
    - On a **right-hand** siderail, install the Graphical Caregiver Interface (GCI)® Control (refer to procedure 4.26).
    - On a **left-hand** siderail, install the sleep surface control panel (refer to procedure 4.25).

16. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

Chapter 5
Parts List

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NOTES:

Warranty

HILL-ROM COMPANY, INC.
LIMITED WARRANTY

Hill-Rom Company, Inc. (Hill-Rom) has a long tradition of providing superior products and service to our customers. Our goal is “Total Customer Satisfaction”. In that spirit, Hill-Rom is proud to offer the following warranty.

GENERAL WARRANTY (APPLICABLE UNLESS A SPECIFIC WARRANTY IS LISTED)

Hill-Rom warrants to the original purchaser that its products and replacement parts shall be free from defects in material and workmanship for a period of one (1) year from date of delivery. Hill-Rom’s obligation under this warranty is expressly limited to supplying replacement parts and/or service for, or replacing, at its option, any product which is, in the sole discretion of Hill-Rom, found to be defective. In addition to the foregoing one year warranty, Hill-Rom warrants to the original purchaser that the frame and welds on its products will be free from structural defects for the life of the product. Any product upgrade or modification initiated by Hill-Rom does not affect the original product warranty.

SPECIFIC WARRANTIES

MATTRESS WARRANTIES

Hill-Rom warrants to the original purchaser that its mattress product shall be free from defects in material and workmanship for a period of two (2) years from date of delivery. However, electro mechanical mattress components (compressors, valves, printed circuit boards, hoses, and couplers) are covered by the general one (1) year warranty.

EXPENDABLES WARRANTIES

A sixty (60) day limited warranty from date of delivery applies to expendable parts such as cushions, coverlets, software diskettes, locator badge batteries, dome light incandescent bulbs, overhead fluorescent tubes, heating elements, temperature probes, filter sheets, and microspheres. This warranty is limited to replacement of the parts covered.

TO OBTAIN PARTS AND SERVICE

In the United States, call Hill-Rom Technical Support Department at (800) 445-3720, Monday through Friday. In Canada, call Hill-Rom Technical Support Department at (800) 267-2337, Monday through Friday. Outside the United States and Canada, call your authorized Hill-Rom Distributor. In order to expedite service, we request you furnish the following information: customer identification number, product model number, serial number, and description of problem. A qualified specialist will provide, via telephone (United States and Canada), or FAX (Outside the United States and Canada), troubleshooting assistance for facility personnel and provide necessary parts to make repairs. If troubleshooting determines the need for on-site technical service, a qualified service representative will be dispatched. Replacement of non-technical items will be the responsibility of the customer. If requested by Hill-Rom, products or parts for which a warranty claim is made shall be returned prepaid to Hill-Rom’s factory.

OUT OF WARRANTY EXCHANGE POLICY

After the expiration of the original warranty, upon request, Hill-Rom will ship as a replacement, components such as selected: motors and printed circuit boards, for like units returned to Hill-Rom by the original purchaser at a substantial savings. Please call Hill-Rom Technical Support Department for current pricing.

PARTS AVAILABILITY POLICY

Hill-Rom will offer parts for new and remanufactured products for ten (10) years from date of sale; for communications products for five (5) years from date of sale.

Note: Some original component parts and assemblies may not be available; functional equivalents may be substituted.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE. HILL-ROM’S OBLIGATION UNDER THESE WARRANTIES SHALL NOT INCLUDE ANY LIABILITY FOR LOSS OF PROFITS, DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR DELAYS. Some states, provinces, or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply. Any improper or negligent use, any alterations or repairs not in accordance with Hill-Rom’s manuals or performed by others in such manner as in Hill-Rom’s sole judgment affects the product materially and adversely, shall void these warranties. These warranties do not cover failures due to misuse, abuse, neglect, or lack of routine maintenance. No employee or representative of Hill-Rom is authorized to change these warranties in any way or grant any other warranty unless in writing and signed by a Hill-Rom officer. These warranties provide specific legal rights; but, there may be other available rights, which vary from state to state, province to province, or country to country.

Revised July 6, 2001

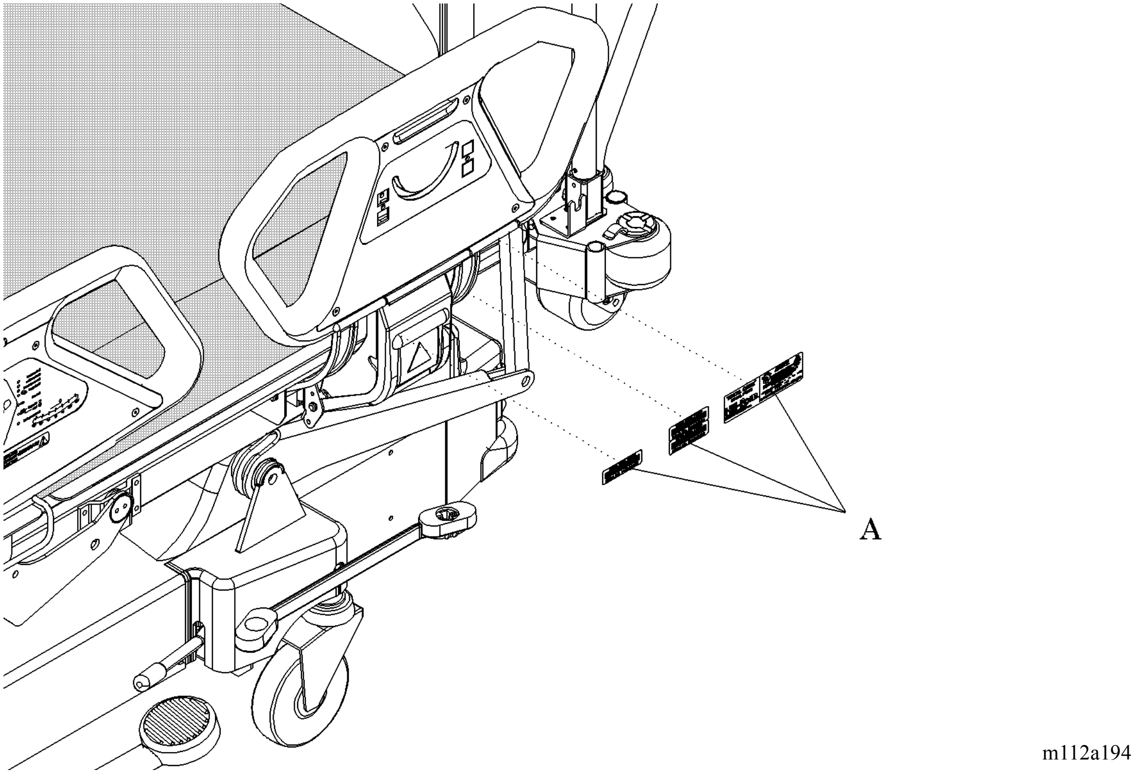
Hill-Rom Company, Inc., 1069 State Route 46 E, Batesville, IN 47006-9167

NOTES:

Service Parts Ordering

Using the parts lists in this manual, identify the part number(s) you require. Find the product number and serial number on the product identification label (A) (see figure 5-1 on page 5-7).

Figure 5-1. Product Identification Label Location



Call Hill-Rom Technical Support at (800) 445-3720 with the following information:

- Six-digit customer account number
- Purchase order number
- Product number
- Serial number
- Part number(s)

To promptly order parts, request part prices and availability, or follow up on a service order, use the following Hill-Rom fax number:

(812) 934-8472

Terms:

- Net 30 days
- F.O.B. Batesville, IN
- Prepaid shipping charges added to invoice
- All orders shipped UPS ground unless specified

Address all inquiries to:

ATTN TECHNICAL SUPPORT—PARTS
HILL-ROM COMPANY, INC.
1069 STATE ROUTE 46 E
BATESVILLE IN 47006-9167

Address all return goods to:

ATTN SERVICE STORES
DISTRIBUTION CENTER DOOR D23
HILL-ROM COMPANY, INC.
COUNTY ROAD 300E
BATESVILLE IN 47006-9167

NOTE:
To eliminate possible delays or incorrect billings, **do not** return any items without a Return Material Authorization (RMA) number. When a return is requested, an RMA packet is included with each order. This packet includes an RMA number, instructions, and a shipping label. If an RMA number is not available, obtain one by phoning Hill-Rom Technical Support at (800) 445-3720.

Exchange Policy

The following are policies for in-warranty and out-of-warranty exchanges from Hill-Rom.

In-Warranty Exchanges

In some cases, Hill-Rom will request that parts/products be returned for inspection. When this occurs, you are expected to return parts/products within 30 days of receipt of the exchange part. If you fail to return the inoperative parts/products within the 30 day period, Hill-Rom will invoice your facility for the full selling price of the parts/products.

NOTE:
The preceding billing procedure pertains **only** to parts/products that Hill-Rom requests to be returned.

In some cases, the invoice accompanying the parts will show the full selling price (only for internal use at Hill-Rom). Do not confuse this price with your price.

Do not return any parts without an RMA number. When parts/products have been requested to be returned, Hill-Rom will include an RMA packet with the parts/products shipment. If an RMA number is not available, obtain one by phoning Hill-Rom Technical Support at (800) 445-3720.

Out-of-Warranty Exchanges

You are expected to return the inoperative parts/products within 30 days of receipt of the exchange part. Hill-Rom will include an RMA packet with the parts/products shipment. If an RMA number is not available, obtain one by phoning Hill-Rom Technical Support at (800) 445-3720. Hill-Rom will invoice your facility for the full selling price of the parts/products. Upon return of the inoperative parts/products, Hill-Rom will issue a credit to your facility for **the difference between the exchange price and the full selling price of the parts/products**.

Recommended Spare Parts

For a recommended spare parts list to service five or more units, see table 5-1 on page 5-10.

Table 5-1. Recommended Spare Parts

Part Number	Quantity	Description
4714301 (1900)	1	Permanent infusion support module
471430301S (1900)	1	Transport handle, lh
471430302S (1900)	1	Transport handle, rh
49144 (1900)	2	IV hook
47246 (1900)	1	Cable assembly, foot pump
4738701 (1900)	1	Cable assembly, accessory AC receptacle (accessory AC receptacle model only)
4733601 (1900)	1	Cable assembly, line cord (North American 120V model only)
6006201 (1900)	1	Capacitor, motor (North American 120V model only)
4840501 (1900)	1	Battery, lead acid, sealed (battery model only)
4704101 (1900)	1	Power/control P.C. board assembly
47290 (1900)	2	Extrusion, slider pivot
49174 (1900)	4	Pad, brake/steer pedal
491420160 (1900)	2	Button, brake pedal
491420258 (1900)	2	Button, steer pedal
SA1695 (1900)	1	Kit, hilow cylinder brace
4723902 (1900)	2	Caster, 5" single wheel brake/steer (single wheel standard height caster model only) (P1900A)
4723901 (1900)	2	Caster, 5" single wheel brake (single wheel standard height caster model only) (P1900A)

Part Number	Quantity	Description
4724002 (1900)	2	Caster, 5" twin wheel brake/steer (twin wheel caster model only) (P1900A and P1900B)
4724001 (1900)	2	Caster, 5" twin wheel brake (twin wheel caster model only) (P1900A and P1900B)
4723904 (1900)	2	Caster, 5" single wheel steer (single wheel extended height caster P1900A and P1900B)
4723903 (1900)	2	Caster, 5" single wheel brake (single wheel extended height caster P1900A and P1900B)
6390602 (1900)	1	Caster, 5" single wheel, brake/steer (single wheel integral caster P1900B model only)
6390601 (1900)	1	Caster, 5" single wheel, brake (single wheel integral caster P1900B model only)
SA1689 (1900)	1	Fuse kit for power control module power control board
SA1561 (1900)	1	Torx®[a] bits
SA9076 (1900)	1	Leak test kit (air module models only)
66729 (1900)	1	Treatment torso module (P1900D models)
66728 (1900)	1	Treatment foot module (P1900D models)
66726 (1900)	1	Pulmonary base module (P1900D models)
48448 (1900)	1	Backplane circuit board (P1900D models)
64531 (1900)	2	Bladder connector
6548801 (1900)	2	Intermediate siderail detection switch
6548802 (1900)	1	Siderail detection switch, lh, head
6548803 (1900)	1	Siderail detection switch, rh, head
63392s (1900)	1	Treatment foot surface control module
63393s (1900)	1	Treatment surface control module
6548701s (1900)	1	P.C. board assembly, weight frame junction box
49309 (1900)	1	Blower, 120 V Multi-stage (120 V model only)
6461101 (1900)	1	Blower, 230 V DC Multi-stage (230 V model only)

Part Number	Quantity	Description
4735701 (1900)	1	Right caregiver positioning P.C. board assembly
4736001 (1900)	1	Left caregiver positioning P.C. board assembly
36199s (1900)	1	Hydraulic fluid—quart
4918136 (1900)	2	Valve solenoid cartridge (A and B model beds)
4918134 (1900)	2	Valve solenoid cartridge (A and B model beds)
4918135 (1900)	2	Valve solenoid cartridge (A and B model beds)
6543034 (1900)	2	Valve solenoid cartridge (C and D model beds)
6543032 (1900)	2	Hydraulic coil
4714711 (1900)	1	Graphical Caregiver Interface (GCI)® Control module (Graphical Caregiver Interface (GCI)® Control model only)
68276 (1900)	2	PAG board (IntelliDrive® Transport System beds only)
68363 (1900)	2	PACM board (IntelliDrive® Transport System beds only)
69316 (1900)	2	Spring, drain assembly (IntelliDrive® Transport System beds only)
68285 (1900)	2	Belt (IntelliDrive® Transport System beds only)
68307 (1900)	2	Motor controller (IntelliDrive® Transport System beds only)
6835001 (1900)	1	Transport handle, left assembly (IntelliDrive® Transport System beds only)
6835002 (1900)	1	Transport handle, right assembly (IntelliDrive® Transport System beds only)
68308 (1900)	2	Battery, 12V (IntelliDrive® Transport System beds only)

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NOTES:

Base Module—Pedal Assemblies

Figure 5-2. Base Module—Pedal Assemblies

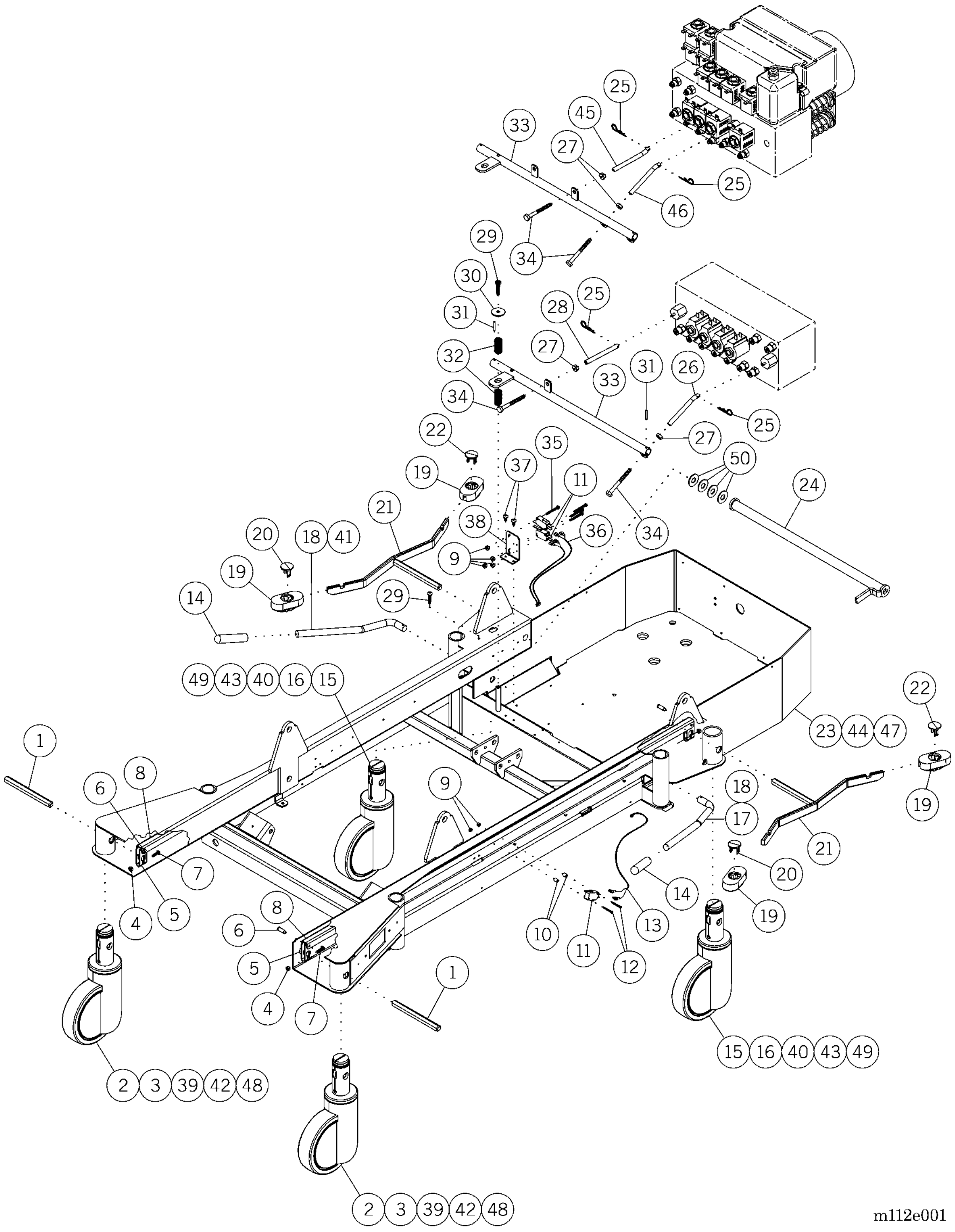
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Table 5-2. Base Module—Pedal Assemblies

Item Number	Part Number	Quantity	Description
1	47184pl (1900)	2	Hex shaft
2	4723902 (1900A)	2	Caster, 5" single wheel brake/steer (single wheel standard height caster model only)
3	4724002 (1900)	2	Caster, 5" twin wheel brake/steer (twin wheel caster model only)
4	4435 (1900)	4	Locknut
5	47220pl (1900)	4	Lever, brake/steer
6	47221pl (1900)	4	Shoulder flat head rivet
7	4582202 (1900)	4	Bolt, round head square neck
8	4718248 (1900)	2	Link, brake/steer
9	20605 (1900)	6	Locknut
10	49164 (1900)	2	Long plastic spacer
11	3071301 (1900)	3	Limit safety switch
12	34402 (1900)	2	Screw
13	3054501 (1900)	1	Cable assembly, brake not set switch
14	64036 (1900)	2	Sleeve, ½" x 2.625 vinyl
15	4723901 (1900)	2	Caster, 5" single wheel brake (single wheel standard height caster model only)
16	4724001 (1900)	2	Caster, 5" twin wheel brake (twin wheel caster model only)
17	472500148 (1900)	1	Pedal, lh CPR/Emergency Trendelenburg
18	39172 (1900)	As required	Adhesive
19	49174 (1900)	4	Pad, brake/steer pedal
20	491420160 (1900)	2	Button, brake pedal
21	4914748 (1900)	2	Weldment, brake/steer pedal
22	491420258 (1900)	2	Button, steer pedal
23	6457948 (1900)	1	Weldment, base (P1900A and P1900B models only)
24	68586pc (1900)	1	Weldment, brake/steer torque tube
25	49138 (1900)	2	Hairpin, cotter

Item Number	Part Number	Quantity	Description
26	49137pl (1900)	1	Link, emergency Trendelenburg
27	91 (1900)	2	Nut standard hex
28	49136pl (1900)	1	Link, CPR
29	43879 (1900)	3	Torx®[a] button head screw
30	44783 (1900)	1	Washer
31	37275 (1900)	2	Roll pin
32	47251 (1900)	2	Compression spring
33	6616348 (1900)	1	CPR/emergency Trendelenburg torque, weldment
34	9001844 (1900)	2	Screw, hex cap
35	19555 (1900)	4	Screw
36	4849901 (1900)	1	Cable assembly, CPR/emergency Trendelenburg activated sensor
37	43878 (1900)	2	Torx® button head screw
38	47318pl (1900)	1	Bracket, switch
39	4723904 (1900)	2	Caster, 5" single wheel steer (single wheel extended height caster P1900B model only)
40	4723903 (1900)	2	Caster, 5" single wheel brake (single wheel extended height caster P1900B model only)
41	472500248 (1900)	1	Pedal, rh CPR/emergency Trendelenburg
42	6390602 (1900)	1	Caster, 5" single wheel, brake/steer (single wheel integral caster P1900B model only)
43	6390601 (1900)	1	Caster, 5" single wheel, brake (single wheel integral caster P1900B model only)
44	6616048 (1900)	1	Base frame weldment (P1900C model only)
45	6616401pl (1900)	1	Link, CPR
46	6616402pl (1900)	1	Link, emergency Trendelenburg

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Item Number	Part Number	Quantity	Description
47	68516 (1900)	1	Weldment, base frame (P1900E model beds)
48	6831002 (1900)	2	Caster, 6" integral, brake (beds equipped with an IntelliDrive® Transport System)
	6831003 (1900)	2	Caster, 6" integral, brake/steer (extended height beds)
49	6831001 (1900)	2	Caster, 6" integral, brake (IntelliDrive® Transport System beds and extended height beds)
50	41047 (1900)	4	Washer (plastic) (used on “A” through “D” model beds after an IntelliDrive® Transport System upgrade)

Base Module—Hilow Assemblies

Figure 5-3. Base Module—Hilow Assemblies

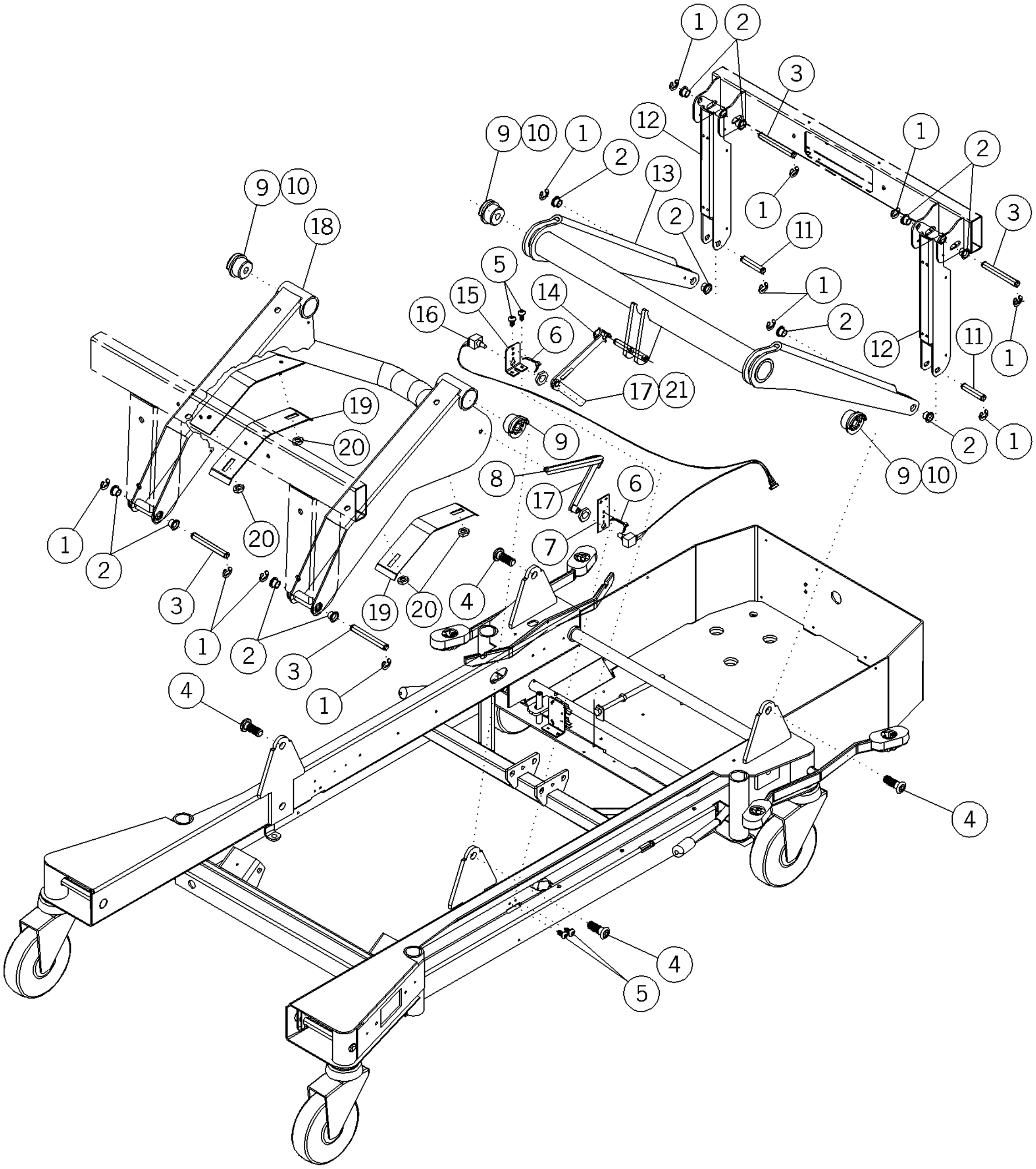
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Table 5-3. Base Module—Hilow Assemblies

Item Number	Part Number	Quantity	Description
1	35325 (1900)	13	E-ring
2	90340-06 (1900)	12	DU flange bushing
3	4727104pl (1900)	4	D-pin
4	47243 (1900)	4	Truss head bolt
5	43878 (1900)	4	Torx®[a] button head screw
6	19124 (1900)	2	Large cable tie
7	47289pl (1900)	1	Sensor mounting bracket, foot lift
8	4915802 (1900)	1	Link, position sensor (foot hilow)
9	47229 (1900)	4	Bearing, hilow lift flange
10	SA3351 (1900)	As required	4 oz. lithium grease
11	4727107pl (1900)	2	D-pin
12	4950948 (1900)	2	Weldment, free link
13	4716548 (1900)	1	Weldment, hilow head lift
14	47287 (1900)	1	Hilow link, head
15	47293pl (1900)	1	Sensor mounting bracket, head lift
16	4850201 (1900)	1	Cable assembly, hilow position sensor
17	47288 (1900)	2	Lift sensor link, lower
18	4716748 (1900)	1	Weldment, hilow foot lift
19	4914548 (1900)	2	Retainer, hose/cable
20	49146 (1900)	4	Self-threading nut
21	39172 (1900)	As required	Adhesive

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Base Module—Cover Assemblies

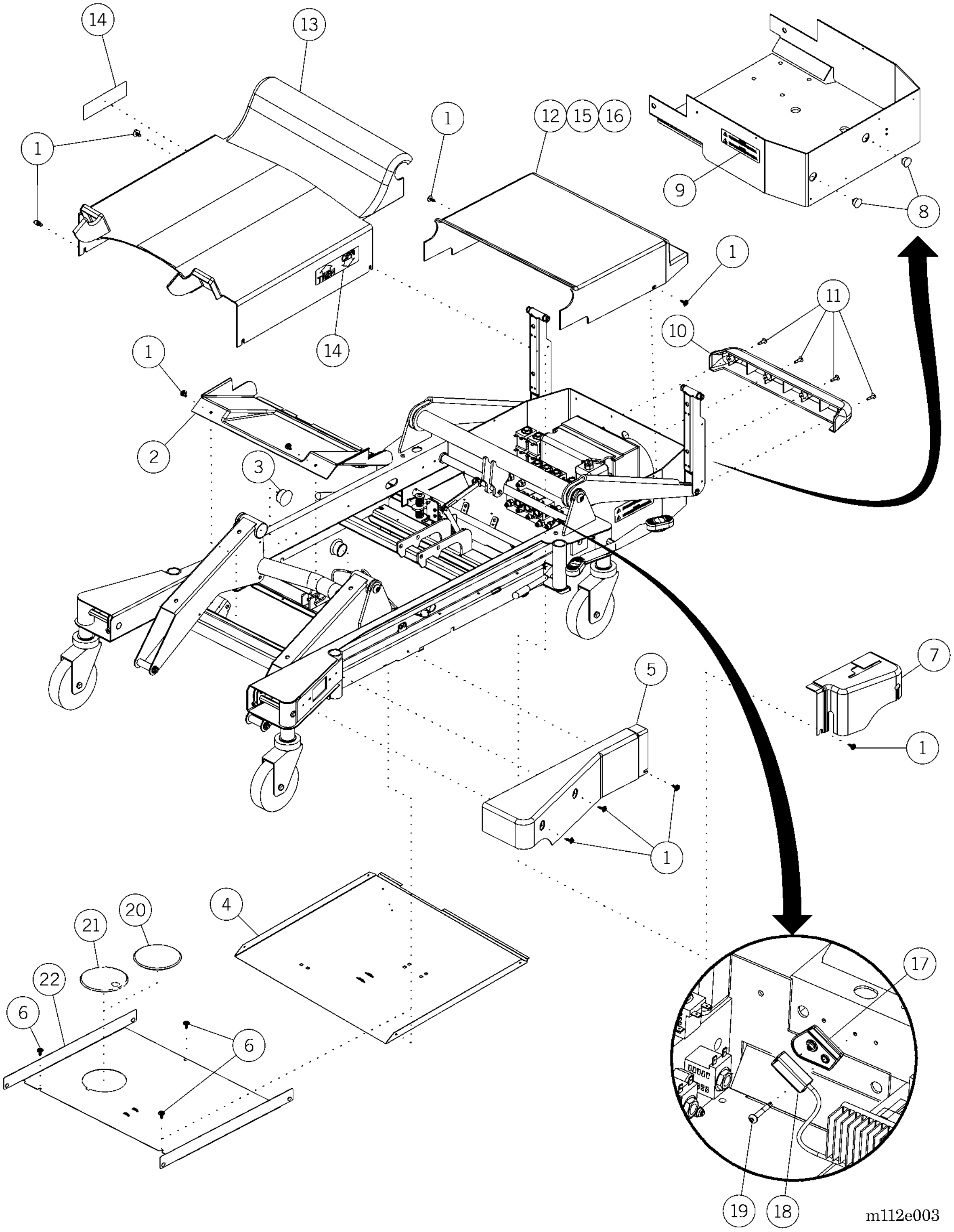
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Figure 5-4. Base Module—Cover Assemblies

Table 5-4. Base Module—Cover Assemblies

Item Number	Part Number	Quantity	Description
1	47172 (1900)	8	Screw #10-32 x 5/8" tapping
2	4947148 (1900)	1	Cover, foot end base
3	3815605 (1900)	2	Hole plug
4	4718148 (1900)	1	Pan, base bottom
5	491700148 (1900)	1	Cover, lh foot end base
6	47172 (1900)	3	Screw ("E" model beds only)
7	491690148 (1900)	1	Cover, lh head end base
8	3815604 (1900)	1 or 2	Hole plug
9	49486 (1900)	1	Label, ground caution
10	4729463 (1900)	1	Bumper, louvered base
11	43726 (1900)	4	Shoulder screw—truss, Torx®[a]
12	64581 (1900)	1	Cover, tub
13	4916848 (1900)	1	Cover, top center base
14	49492 (1900)	2	Label, CPR/emergency Trendelenburg pedal
15	62024 (1900)	1	Insulation foam, rear case cover
16	62025 (1900)	1	Insulation foam, rear base cover
17	68482 (1900)	1	Steer switch spacer (IntelliDrive® Transport System beds only)
18	68483 (1900)	1	Steer switch (IntelliDrive® Transport System beds only)
19	43879 (1900)	1	Screw (IntelliDrive® Transport System beds only)
20	6848501 (1900)	1	Access cover, without hole ("E" model beds only)
21	6848502 (1900)	1	Access cover, with hole (IntelliDrive® Transport System beds only)
22	68321 (1900)	1	Dust cover ("E" model beds only)

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Intermediate Frame Module

Figure 5-5. Intermediate Frame Module

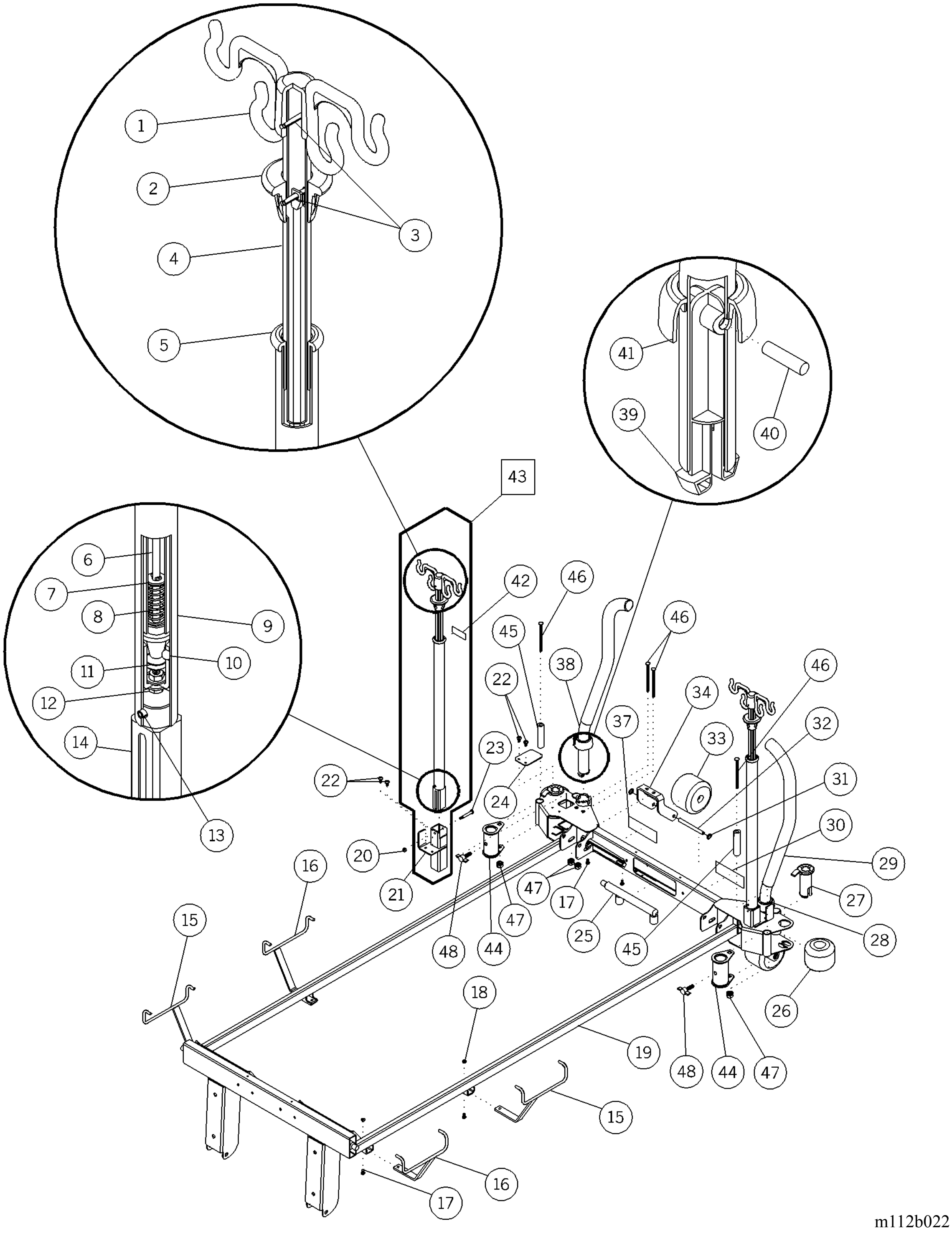
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Table 5-5. Intermediate Frame Module

Item Number	Part Number	Quantity	Description
1	49144 (1900)	2	IV hook (permanent ISS model only)
2	4438901 (1900)	2	Release (permanent ISS model only)
3	10904 (1900)	4	Roll pin (permanent ISS model only)
4	4440001 (1900)	2	Weldment, upper tube (permanent ISS model only)
5	4439601 (1900)	2	Bearing (permanent ISS model only)
6	4439001 (1900)	2	Plunger (permanent ISS model only)
7	2449 (1900)	6	Washer (permanent ISS model only)
8	34418 (1900)	2	Compression spring (permanent ISS model only)
9	47306pl (1900)	2	Base pipe—IV pole (permanent ISS model only)
10	44393 (1900)	6	Roller ball (permanent ISS model only)
11	44383 (1900)	2	Ball retainer (permanent ISS model only)
12	40497 (1900)	4	#10-32 keps nut (permanent ISS model only)
13	49482 (1900)	2	Spiral pin (permanent ISS model only)
14	47317 (1900)	2	Extension, IV pole (permanent ISS model only)
15	4713601 (1900)	2	Weldment, drainage hook, rh
16	4713602 (1900)	2	Weldment, drainage hook, lh
17	49521 (1900)	4 or 12	¼"-20 x 5/8" six-lobe Torx®[a] screw
18	4435 (1900)	4	Locknut
19	47125 (1900)	1	Weldment, intermediate frame
20	755 (1900)	2	Locknut (permanent ISS model only)
21	4713448 (1900)	2	Weldment, permanent infusion support (permanent ISS model only)
22	43878 (1900)	4 or 6	Torx® button head screw
23	1439901 (1900)	2	Shoulder bolt (permanent ISS model only)
24	47162 (1900)	2	Plate, cover
25	49189pl (1900)	4	Weldment, dummy load beam (model without scale only)

Item Number	Part Number	Quantity	Description
26	47219 (1900)	2	Bumper
27	4715301 (1900)	2	Bumper pin
28	4950501 (1900)	1	Transport handle, lh (transport handle model only)
29	46395 (1900)	2	Cover (transport handle model only)
30	49485 (1900)	1	Label, head end capacity
31	25210 (1900)	4	Push nut
32	25208 (1900)	2	Axle
33	3455764 (1900)	2	Roller bumper
34	4950748 (1900)	2	Roller bumper bracket
35			
36			
37	49484 (1900)	1	Label, trapeze caution
38	4950502 (1900)	1	Transport handle, rh (transport handle model only)
39	49506 (1900)	2	Plug, transport handle (transport handle model only)
40	64784 (1900)	2	Groove pin ¼" x 1 3/8" shearproof (transport handle model only)
41	49127 (1900)	2	Cover, transport handle mechanism (transport handle model only)
42	49495 (1900)	2	Label, IV pump mounting (permanent ISS model only)
43	4714301 (1900)	1	Permanent infusion support module (P1924) (permanent ISS model only)
44	63439 (1900)	2	Weldment, ISS adapter (ISS adapter socket model only)
45	63443 (1900)	2	Spacer, ISS adapter (ISS adapter model only)
46	6322101 (1900)	4 or 6	Square neck bolt
47	831 (1900)	4 or 6	Locknut
48	38135 (1900)	2	Knob assembly (ISS adapter model only)

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NOTES:

Articulating Deck Module

Figure 5-6. Articulating Deck Module

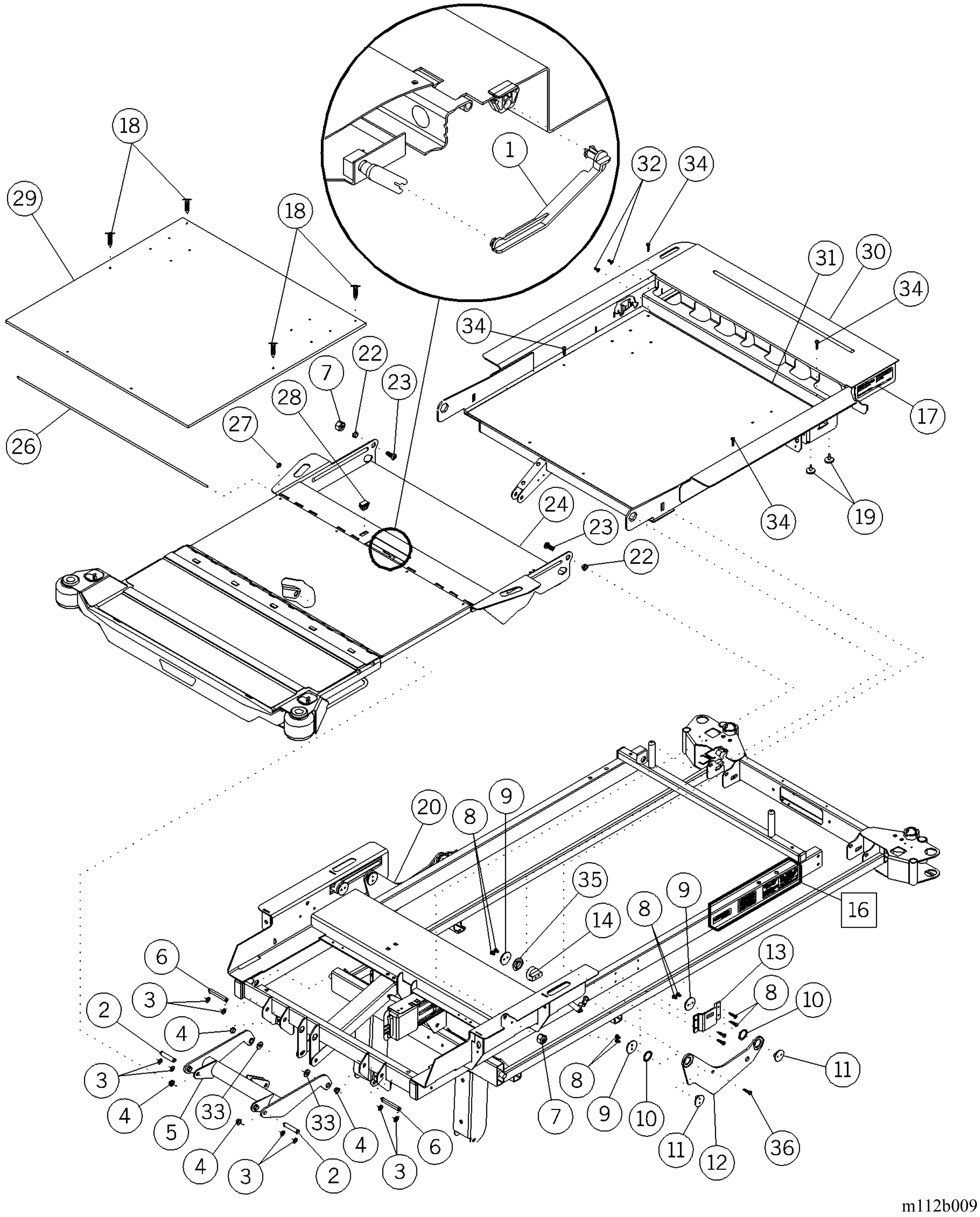
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Table 5-6. Articulating Deck Module

Item Number	Part Number	Quantity	Description
1	49160 (1900)	1	Sensor link, knee
2	4727106pl (1900)	4	D-pin
3	3532501 (1900)	16	Retaining ring
4	49498 (1900)	10	Bushing, keyed
5	4729548 (1900)	1	Weldment, swing link
6	4727109pl (1900)	2	D-pin
7	49200 (1900)	2	Hex stop nut
8	63166 (1900)	12	Lobe, special head type, #23 screw
9	47292plf (1900)	6	Retainer, slider pivot
10	49131 (1900)	4	Washer, plastic
11	49128 (1900)	4	Bearing, self-lubricating
12	4727001 (1900)	1	Arm, retracting, lh
13	4912948 (1900)	2	Bracket, mount, retracting arm
14	65577 (1900)	2	Slide pivot
15			
16	6274001 (1900)	1	Label, serial number
17	4647505 (1900)	1	Label (Federal Drug Administration) (fluoroscopy model only)
18	63346 (1900)	4	Clip (head panel with air model only)
19	41344 (1900)	2	Plug bumper
20	4727002 (1900)	1	Arm, retracting, rh
21			
22	36570 (1900)	2	Oilite®[a] bushing
23	49139 (1900)	4	Cap screw, button head socket
24	4718548 (1900)	1	Weldment, thigh section
25			
26	49133 (1900)	1	Pin, thigh hinge
27	49494 (1900)	1	E-ring
28	49159 (1900)	1	Sensor pivot lug, knee

Item Number	Part Number	Quantity	Description
29	49126 (1900)	1	Fluoroscopy panel (fluoroscopy model only)
30	65579 (1900)	1	Head section weldment
31	4912548 (1900)	1	Standard head section panel (standard head section panel model only)
32	64765 (1900)	8	Screw, ¼"-20 low profile
33	41298 (1900)	4	Washer—nylon
34	44489 (1900)	4	Six-lobe pan head screw (head panel without air model only)
35	65578 (1900)	2	Washer
36	42142 (1900)	2	Pan head screw

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Articulating Deck Module—Foot Section

Figure 5-7. Articulating Deck Module—Foot Section

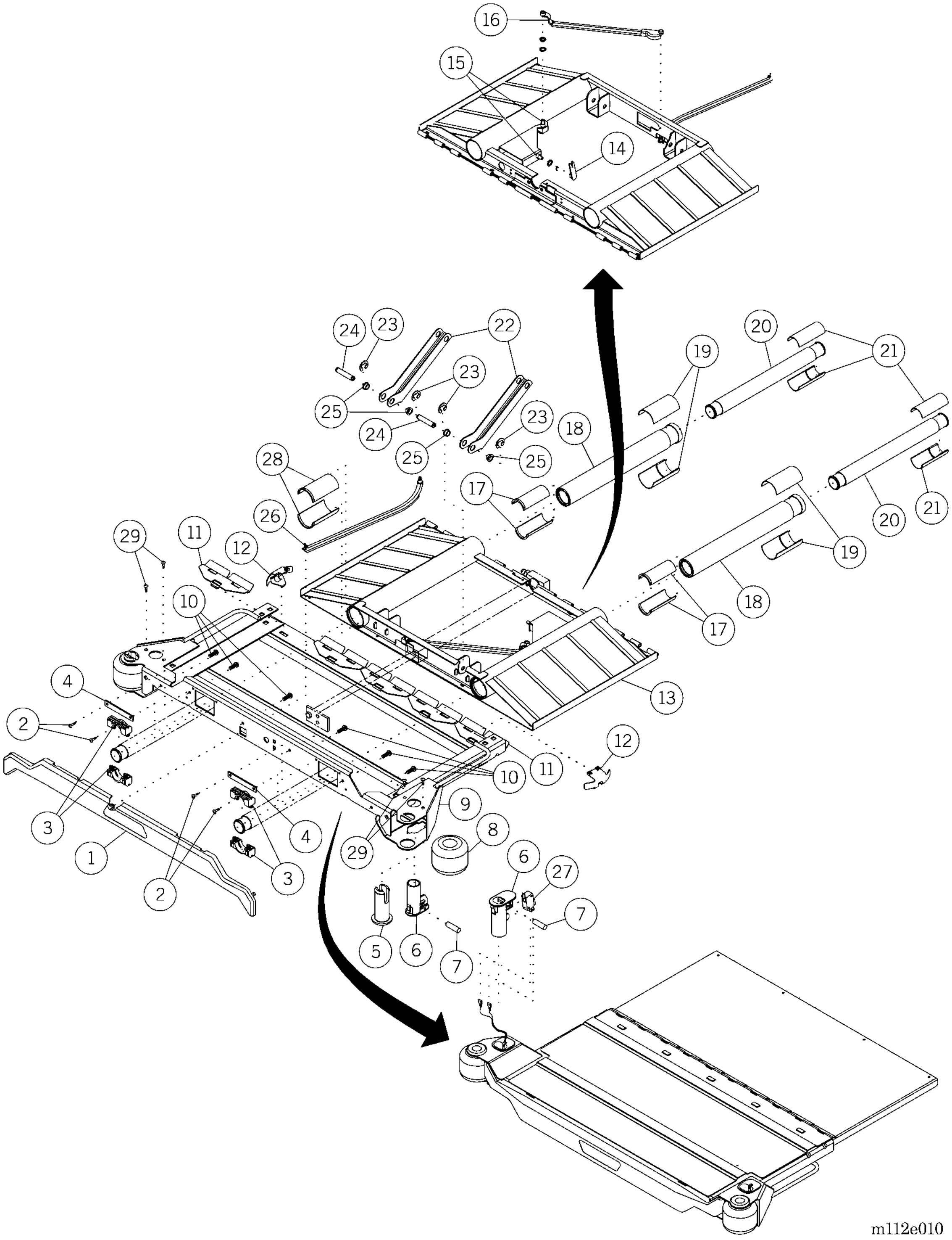
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Table 5-7. Articulating Deck Module—Foot Section

Item Number	Part Number	Quantity	Description
1	49464 (1900)	1	Cover, moving foot section
2	43878 (1900)	17	Torx®[a] button head screw
3	47213 (1900)	4	Terminator, foot slide
4	4917648 (1900)	2	Retainer bar, foot slide
5	4715302 (1900)	2	Bumper pin
6	49461 (1900)	2	Socket, footboard
7	49517 (1900)	1	Dowel pin, stainless
8	47219 (1900)	2	Bumper
9	4720148 (1900)	1	Weldment, moveable foot
10	42142 (1900)	15	Pan head screw
11	4913448 (1900)	5	Wiper, moving foot
12	47215 (1900)	2	Slide, corner, foot section
13	4719248 (1900)	1	Weldment, fixed foot
14	49156 (1900)	1	Sensor crank, knee
15	39172 (1900)	As required	Adhesive
16	49151 (1900)	1	Sensor crank, foot extension
17	47208 (1900)	4	Split bushing, front, inner slide
18	47217pl (1900)	2	Tube, slide intermediate
19	47207 (1900)	4	Split bushing, rear, outer slide
20	47218pl (1900)	2	Tube, slide inner
21	47209 (1900)	4	Split bushing, rear, inner slide
22	4721048 (1900)	2	Link, floating, foot section
23	3532501 (1900)	16	Retaining ring
24	4727106pl (1900)	4	D-pin
25	49498 (1900)	10	Bushing, keyed
26	49152 (1900)	1	Sensor link, foot extension
27	3071301 (1900)	1	Limit safety switch
28	47206 (1900)	4	Split bushing, front, outer slide
29	42140 (1900)	4	Screw

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Weigh Frame Module

Figure 5-8. Weigh Frame Module

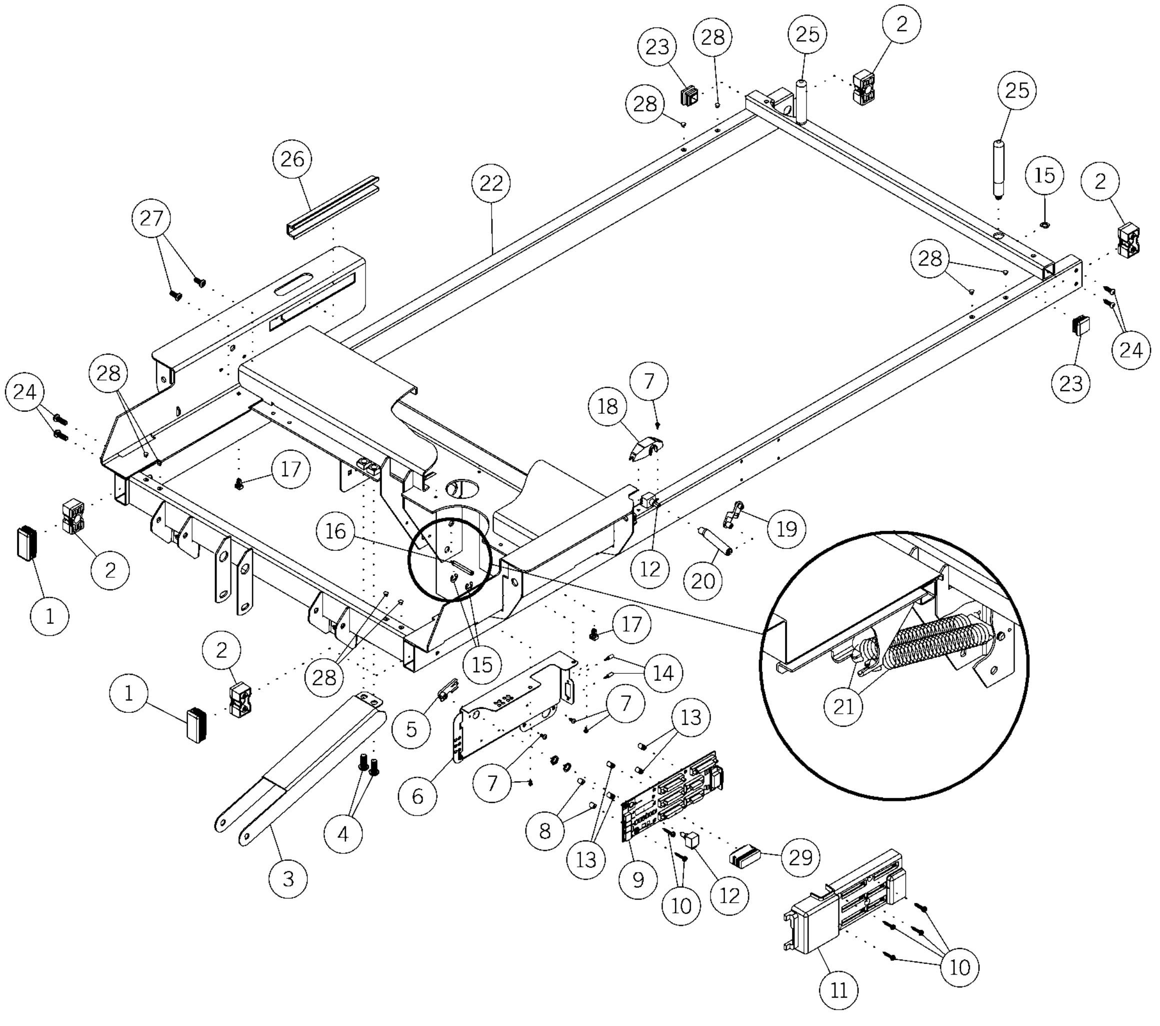
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Table 5-8. Weigh Frame Module

Item Number	Part Number	Quantity	Description
1	4917702 (1900)	2	Plug, frame tube
2	49135 (1900)	4	Bearing, load beam, weigh frame
3	4730448 (1900)	1	Channel, head cylinder
4	49139 (1900)	4	Cap screw, button head socket
5	49157 (1900)	1	Sensor crank, thigh
6	49197pl (1900)	1	Base plate, junction box
7	43878 (1900)	17	Torx®[a] button head screw
8	49164 (1900)	2	Long plastic spacer
9	6548701s (1900)	1	P.C. board assembly, weigh frame junction box
10	49508 (1900)	6	Screw, formed, hex washer
11	4919848 (1900)	1	Cover, junction box
12	39172 (1900)	As required	Adhesive
13	49173 (1900)	4	Self-retaining spacer
14	42006 (1900)	2	Screw lock
15	3532501 (1900)	16	Retaining ring
16	4727105pl (1900)	3	D-pin
17	40421 (1900)	2	Cable tie mount
18	49455 (1900)	1	Cover, head sensor
19	49154 (1900)	1	Short link, head sensor
20	49155 (1900)	1	Long link, head sensor
21	49195 (1900)	2	Spring, extension
22	4911648 (1900)	1	Weldment, weigh frame
23	4917701 (1900)	2	Plug, frame tube
24	42142 (1900)	14	Pan head screw
25	49124pl (1900)	2	Post, head panel
26	47290 (1900)	2	Extrusion, slider pivot
27	64765 (1900)	8	Screw, ¼"-20 low profile
28	62816 (1900)	8	Hole plug
29	3069801 (1900)	1	Adapter (non-SideCom® Communication System beds)

a. Torx® is a registered trademark of Textron, Inc.

Weigh Frame Module—Cable Routing and Mattress Retainer

Figure 5-9. Weigh Frame Module—Cable Routing and Mattress Retainer

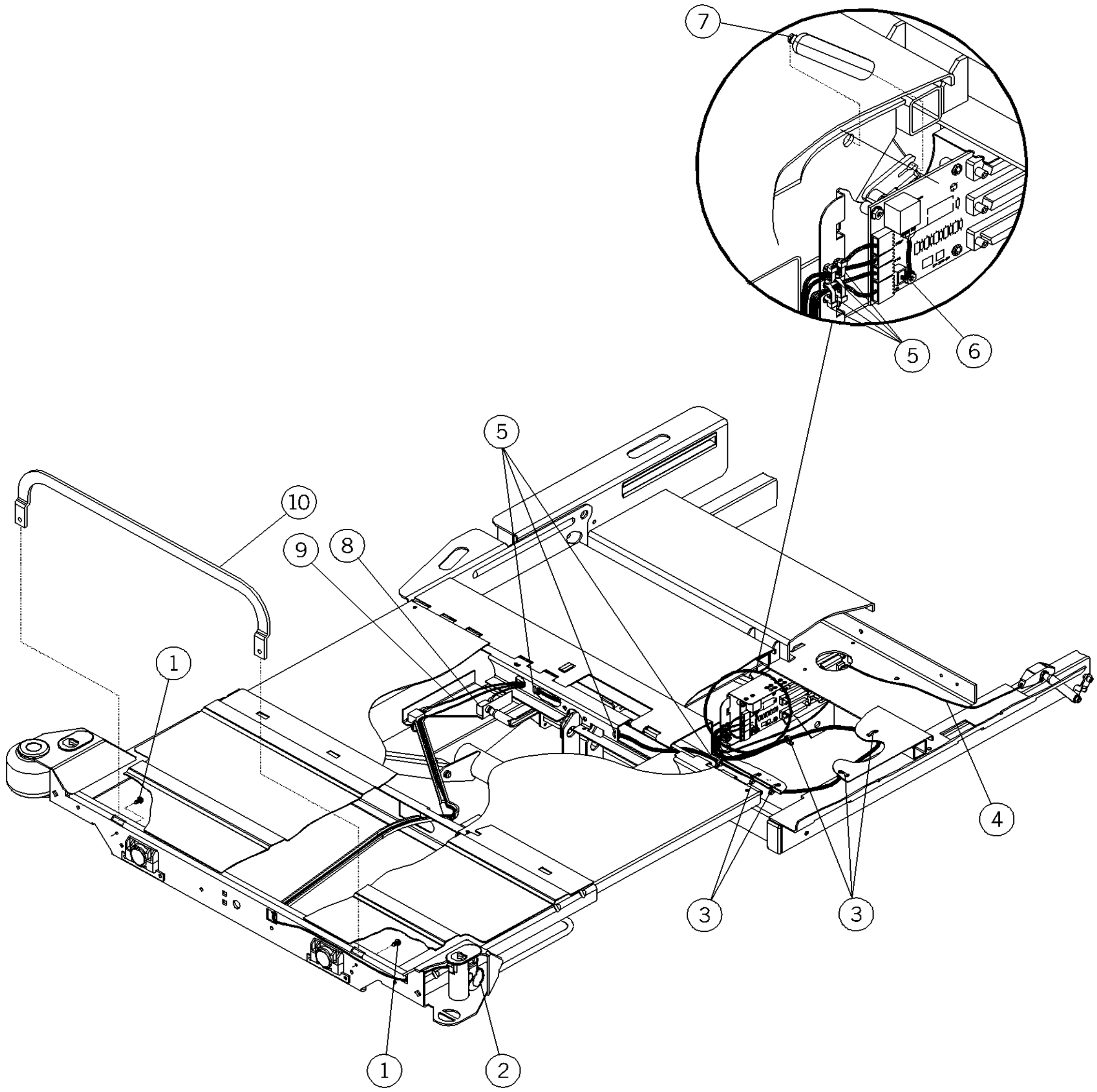

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Table 5-9. Weigh Frame Module—Cable Routing and Mattress Retainer

Item Number	Part Number	Quantity	Description
1	43878 (1900)	2	Torx®[a] button head screw (mattress retainer model only)
2	3054401 (1900)	1	Footprop detection switch cable assembly
3	19124 (1900)	5	Large cable tie
4	3054601 (1900)	1	Head position sensor and cable assembly
5	14450 (1900)	7	Small cable tie
6	3058401 (1900)	1	Cable assembly, knee position sensor
7	4915801 (1900)	1	Link, position sensor (knee)
8	3054603 (1900)	1	Foot articulation position sensor and cable assembly
9	3054602 (1900)	1	Foot retraction position sensor and cable assembly
10	4917848 (1900)	1	Mattress stop, foam foot (mattress retainer model only)

[a] Torx® is a registered trademark of Textron, Inc.

Head Siderail Module

Figure 5-10. Head Siderail Module

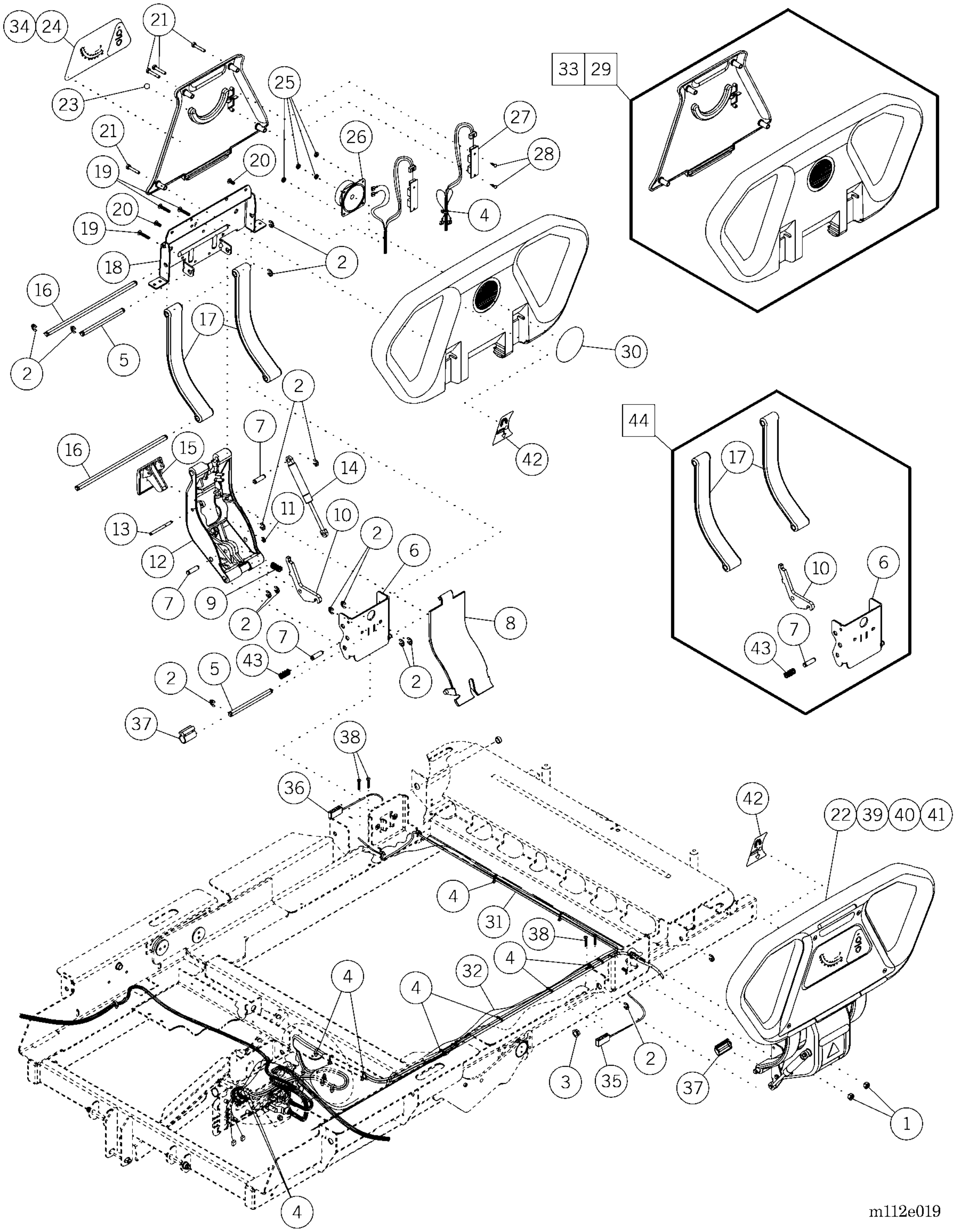
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Table 5-10. Head Siderail Module

Item Number	Part Number	Quantity	Description
1	20802 (1900)	2**	Keps nut
2	3532501 (1900)	15**	Retaining ring
3	36570 (1900)	1**	Oilite®[a] bushing
4	19124 (1900)	22**	Cable tie
5	4727102pl (1900)	2**	D-pin
6	68872-48 (1900)	1**	Weldment, siderail mount
7	68861 (1900)	3**	Pin, latch
8	63250 (1900)	1**	Center cover arm
9	49111 (1900)	1**	Spring, latch bias
10	68860 (1900)	1**	Spring, latch bias
11	49193 (1900)	1**	E-ring
12	62753 (1900)	1**	Center arm, siderail
13	47144pl (1900)	1**	Shaft, siderail release lever pivot
14	47323 (1900)	1**	Dampener
15	47256 (1900)	1**	Release lever, siderail
16	69078pl (1900)	2**	D-pin
17	68873 (1900)	2**	Siderail arm, outer support with bearing
18	47274 (1900)	1**	Bracket, upper rail
19	42140 (1900)	3**	Screw
20	42142 (1900)	2**	Pan head screw
21	4727302 (1900)	4**	Screw
22	47146102s (1900)	1	Head siderail (lh), without speakers
23	47272 (1900)	1**	Angle ball
24	4910902 (1900)	1	Label, head angle indicators, rh (rh siderail only)
25	28562 (1900)	4**	Palnut (model with speaker only)
26	38873 (1900)	1**	Speaker (model with speaker only)

a. Oilite® is a registered trademark of Beemer Precision, Incorporated.

** Quantities shown are per siderail.

Item Number	Part Number	Quantity	Description
27	4843301 (1900)	1	P.C. board assembly, bed up/down
28	4214101 (1900)	2	Screw, hilow
29	6537101 (1900)	1	Head siderail assembly, rh
30	49453 (1900)	1**	Label, blank speaker (model without speaker only)
31	6305902 (1900)	1	Cable assembly, weigh frame to head siderail, rh (rh siderail only)
32	6305901 (1900)	1	Cable assembly, weigh frame to head siderail, lh (lh siderail only)
33	6537102 (1900)	1	Head siderail assembly, lh
34	4910901 (1900)	1	Label, head angle indicator lh (lh siderail)
35	6548802 (1900)	1	Head siderail detection switch, lh (lh siderail with head siderail detection switch option)
36	6548803 (1900)	1	Head siderail detection switch, rh (rh siderail with head siderail detection switch option)
37	65465 (1900)	1**	Magnet assembly (siderail with head siderail detection switch option only)
38	65614 (1900)	4**	Screw, with patch (siderail with head siderail detection switch option)
39	47146103s (1900)	1	Head siderail, rh, without speakers
40	47146100s (1900)	1	Head siderail, lh, with speakers
41	47146101s (1900)	1	Head siderail, rh, with speaker—English
42	66937 (1900)	2	Pulmonary shoulder location label
43	68913 (1900)	1**	Spring, latch

** Quantities shown are per siderail.

Item Number	Part Number	Quantity	Description
44	P1950A03 (1900)	1**	Intermediate siderail upgrade (when ordering any parts contained in this kit for a non-pulmonary bed with a serial number D034AM6995 and earlier, order this kit as the parts contained are **not** backwards compatible)

** Quantities shown are per siderail.

Intermediate Siderail Assembly—RH

Figure 5-11. Intermediate Siderail Assembly—RH

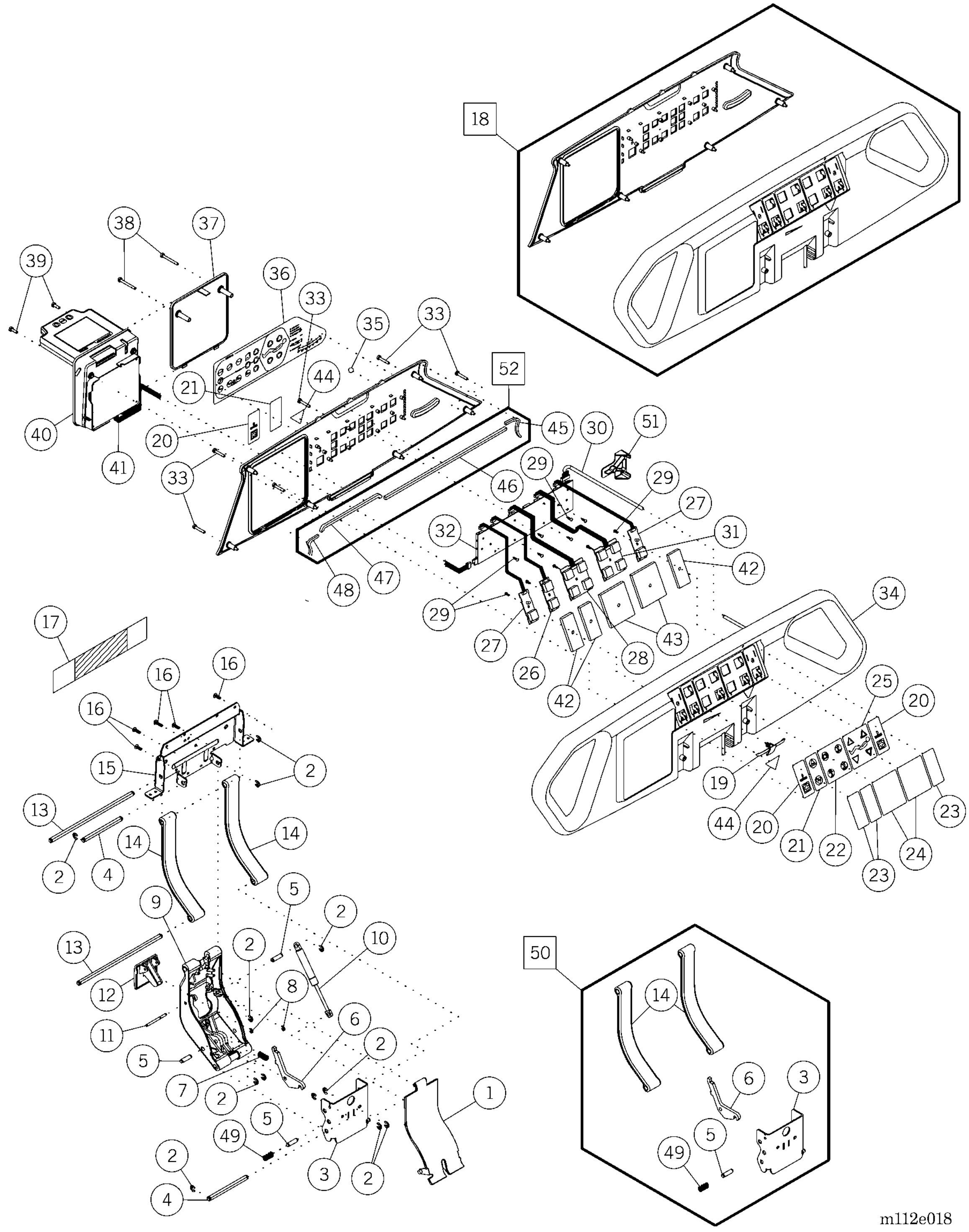
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Table 5-11. Intermediate Siderail Assembly—RH

Item Number	Part Number	Quantity	Description
1	63250 (1900)	1	Center arm cover
2	3532501 (1900)	14	Retaining ring
3	68872-48 (1900)	1	Weldment, siderail mount
4	4727102pl (1900)	2	D-pin
5	68861 (1900)	3	Pin, latch
6	68860 (1900)	1	Spring, latch bias
7	49111 (1900)	1	Spring, latch bias
8	49193 (1900)	2	E-ring
9	62753 (1900)	1	Center arm, siderail
10	47323 (1900)	1	Dampener
11	47144pl (1900)	1	Shaft, siderail release lever pivot
12	4725663 (1900)	1	Release lever, siderail
13	4727101pl (1900)	2	D-pin
14	68873 (1900)	2	Siderail, arm, outer support with bearing
15	4727448 (1900)	1	Bracket, upper rail
16	4388002 (1900)	4	Screw, lock head Torx®[a]
17	64575 (1900)	1	User control module insulator
18	65370 (1900)	1	Intermediate siderail assembly, rh
	47147103s (1900)	1	Intermediate siderail assembly, rh with patient controls and Graphical Caregiver Interface (GCI)® Control
19	47286 (1900)	1	Volume slide knob (patient lighting/ entertainment control model only)
20	49102 (1900)	1	Label, nurse call (nurse call control model only)
21	49106-04 (1900)	1	Label, enhanced arrow up and down (enhanced patient entertainment control model only)

[a] Torx® is a registered trademark of Textron, Inc.

Item Number	Part Number	Quantity	Description
22	4910602 (1900)	1	Label, patient entertainment rh (patient lighting/entertainment control model only)
23	49451 (1900)	4	Label, blank two button (blank two button model only)
24	49452 (1900)	1	Label, blank four button (blank four button model only)
25	4910702 (1900)	1	Label, patient articulation rh (patient positioning control model only)
26	4736901 (1900)	1	Patient control enhanced entertainment, P.C. board (enhanced patient entertainment control model only)
27	4742001 (1900)	1	Nurse call, P.C. board (nurse call control model only)
28	4839204 (1900)	1	Patient entertainment P.C. board and cable assembly rh (patient lighting/ entertainment control model only)
29	4214101 (1900)	2 or 4	Screw, hilow
30	4851102 (1900)	1	Cable assembly, weigh frame/ intermediate siderail, rh
31	4839203 (1900)	1	P.C. board assembly—rh—patient positioning (patient positioning control model only)
32	4735701 (1900)	1	Right caregiver positioning P.C. board assembly
33	4727302 (1900)	6	Screw, #10-24 x 1.125"—nylon
34	47147101s (1900)	1	Siderail, rh
35	47272 (1900)	1	Angle ball
36	4910102 (1900)	1	Label, caregiver control, rh
37	4728502 (1900)	1	Cover, bed setup controls blank (model without Graphical Caregiver Interface (GCI)® Control only)
38	4727303 (1900)	2	Screw, #10-24 x 1¾"—nylon (model without Graphical Caregiver Interface (GCI)® Control only)

Item Number	Part Number	Quantity	Description
39	4727301 (1900)	2	Screw, #10-24 x 0.625"—nylon (Graphical Caregiver Interface (GCI)® Control model only)
40	4714711 (1900)	1	Graphical Caregiver Interface (GCI)® Control module (Graphical Caregiver Interface (GCI)® Control model only)
41	4736101 (1900)	1	Graphical Caregiver Interface (GCI)® Control LON cable assembly (Graphical Caregiver Interface (GCI)® Control model only)
42	4911002 (1900)	1	Shield, two button blank (blank two button model only)
43	4911001 (1900)	1	Shield, four button blank (blank four button model only)
44	65262101 (1900)	2	Label, hip locator, English
45	6678301 (1900)	1	Gasket, rh
46	66784 (1900)	1	Gasket, top
47	66785 (1900)	1	Gasket, panel
48	6678302 (1900)	1	Gasket, lh
49	68913 (1900)	1	Spring, latch
50	P1950A03 (1900)	1	Intermediate siderail upgrade (when ordering any parts contained in this kit for a non-pulmonary bed with a serial number D034AM6995 and earlier, order this kit as the parts contained are **not** backwards compatible)
51	68769 (1900)	1	User control module support
52	SA1712 (1900)	1	Siderail gasket kit

Intermediate Siderail Assembly—LH

Figure 5-12. Intermediate Siderail Assembly—LH

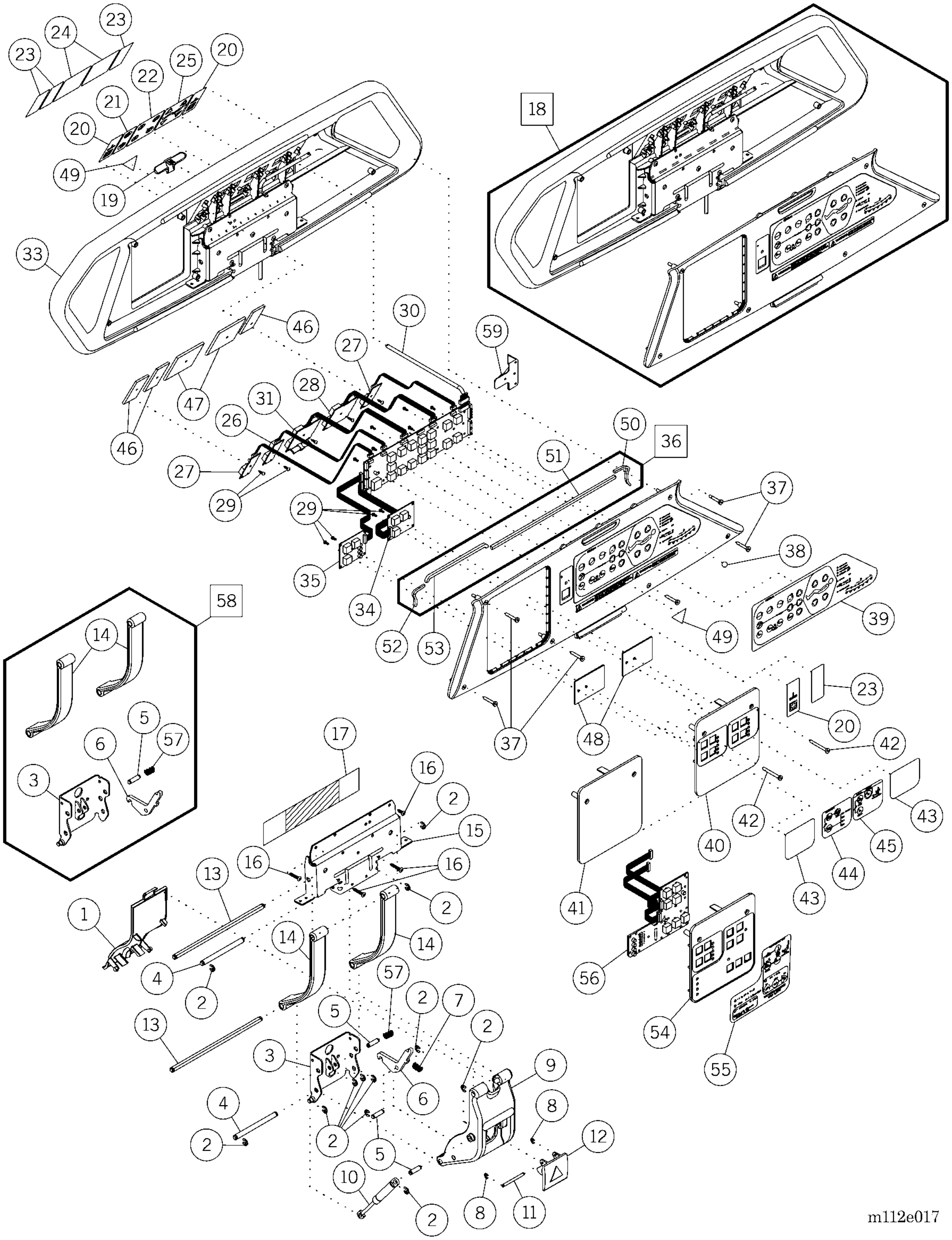
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Table 5-12. Intermediate Siderail Assembly—LH

Item Number	Part Number	Quantity	Description
1	63250 (1900)	1	Center arm cover
2	3532501 (1900)	14	Retaining ring
3	68872-48 (1900)	1	Weldment, siderail mount
4	4727102pl (1900)	2	D-pin
5	68861 (1900)	3	Pin, latch
6	68860 (1900)	1	Latch
7	49111 (1900)	1	Spring, latch bias
8	49193 (1900)	2	E-ring
9	62753 (1900)	1	Center arm, siderail
10	47323 (1900)	1	Dampener
11	47144pl (1900)	1	Shaft, siderail release lever pivot
12	4725663 (1900)	1	Release lever, siderail
13	4727101pl (1900)	2	D-pin
14	68873 (1900)	2	Siderail, arm, outer support with bearing
15	47274pl (1900)	1	Bracket, upper rail
16	4388002 (1900)	4	Screw, lock head Torx®[a]
17	64575 (1900)	1	User control module insulator
18	65369 (1900)	1	Intermediate siderail assembly, LH
	47147102s (1900)	1	Intermediate siderail assembly, LH with patient controls and scale/patient exit
19	47286 (1900)	1	Volume slide knob (patient lighting/ entertainment control model only)
20	49102 (1900)	3	Label, nurse call (nurse call control model only)
21	49106-04 (1900)	1	Label, enhanced arrow up and down (enhanced patient entertainment model only)

a. Torx® is a registered trademark of Textron, Inc.

Item Number	Part Number	Quantity	Description
22	4910601 (1900)	1	Label, patient entertainment lh (patient lighting/entertainment control model only)
23	49451 (1900)	4	Label, blank two button (blank two button model only)
24	49452 (1900)	1	Label, blank four button (blank four button model only)
25	4910701 (1900)	1	Label, patient articulation lh (patient positioning control model only)
26	4736901 (1900)	1	Patient control enhanced entertainment, P.C. board (enhanced patient entertainment control model only)
27	4742001 (1900)	2	Nurse call, P.C. board (nurse call control model only)
28	4839201 (1900)	1	Patient positioning P.C. board and cable assembly, lh (patient positioning control model only)
29	4214101 (1900)	12	Screw, hilow
30	4851101 (1900)	1	Cable assembly, weigh frame/ intermediate siderail, lh
31	4839202 (1900)	1	Patient entertainment P.C. board and cable assembly lh (patient lighting/ entertainment control model only)
32	4736001 (1900)	1	Left caregiver positioning P.C. board assembly
33	47147100s (1900)	1	Intermediate siderail assembly, complete (lh) (if ordering for an “A” through “E” model bed, order the opposite siderail at the same time)
34	4705601 (1900)	1	Mattress control assembly (model with mattress surface bed setup control only)
35	4705602 (1900)	1	Bed exit detection assembly (models with patient exit bed setup control only)
36	SA1712 (1900)	1	Siderail gasket kit
37	4727302 (1900)	6	Screw, #10-24 x 1.125—nylon
38	47272 (1900)	1	Angle ball

Item Number	Part Number	Quantity	Description
39	4910101 (1900)	1	Label, caregiver control lh
40	4728501 (1900)	1	Cover, bed setup controls (model with bed setup control only)
41	4728502 (1900)	1	Cover, bed setup controls blank (model without bed setup control only)
42	4727303 (1900)	2	Screw, #10-24 x 1¾"—nylon
43	49105 (1900)	2	Label, blank setup (model without bed setup control only)
44	49103 (1900)	1	Label, bed exit (model with patient exit bed setup control only)
45	4910401 (1900)	1	Label, surface prevention (model with mattress surface bed setup control only)
46	4911002 (1900)	1	Shield, two button blank (blank two button model only)
47	4911001 (1900)	1	Shield, four button blank (blank four button model only)
48	4911003 (1900)	1	Shield, setup (model without bed setup control only)
49	65262101 (1900)	2	Label, hip locator, English
50	6678302 (1900)	1	Gasket, lh
51	66784 (1900)	1	Gasket, top
52	66785 (1900)	1	Gasket, panel
53	6678301 (1900)	1	Gasket, rh
54	4728503 (1900)	1	Cover, pulmonary bed setup controls (pulmonary model only)
55	49104102 (1900)	1	Pulmonary hard panel label (pulmonary model only)
56	60392 (1900)	1	P.C. board, rotational control (pulmonary model only)
57	68913 (1900)	1	Spring, latch

Item Number	Part Number	Quantity	Description
58	P1950A03 (1900)	1	Intermediate siderail upgrade (when ordering any parts contained in this kit for a non-pulmonary bed with a serial number D034AM6995 and earlier, order this kit as the parts contained are **not** backwards compatible)
59	68769 (1900)	1	Support bracket

NOTES:

Intermediate Siderail Assembly—Installation and Cable Routing

Figure 5-13. Intermediate Siderail Assembly—Installation and Cable Routing

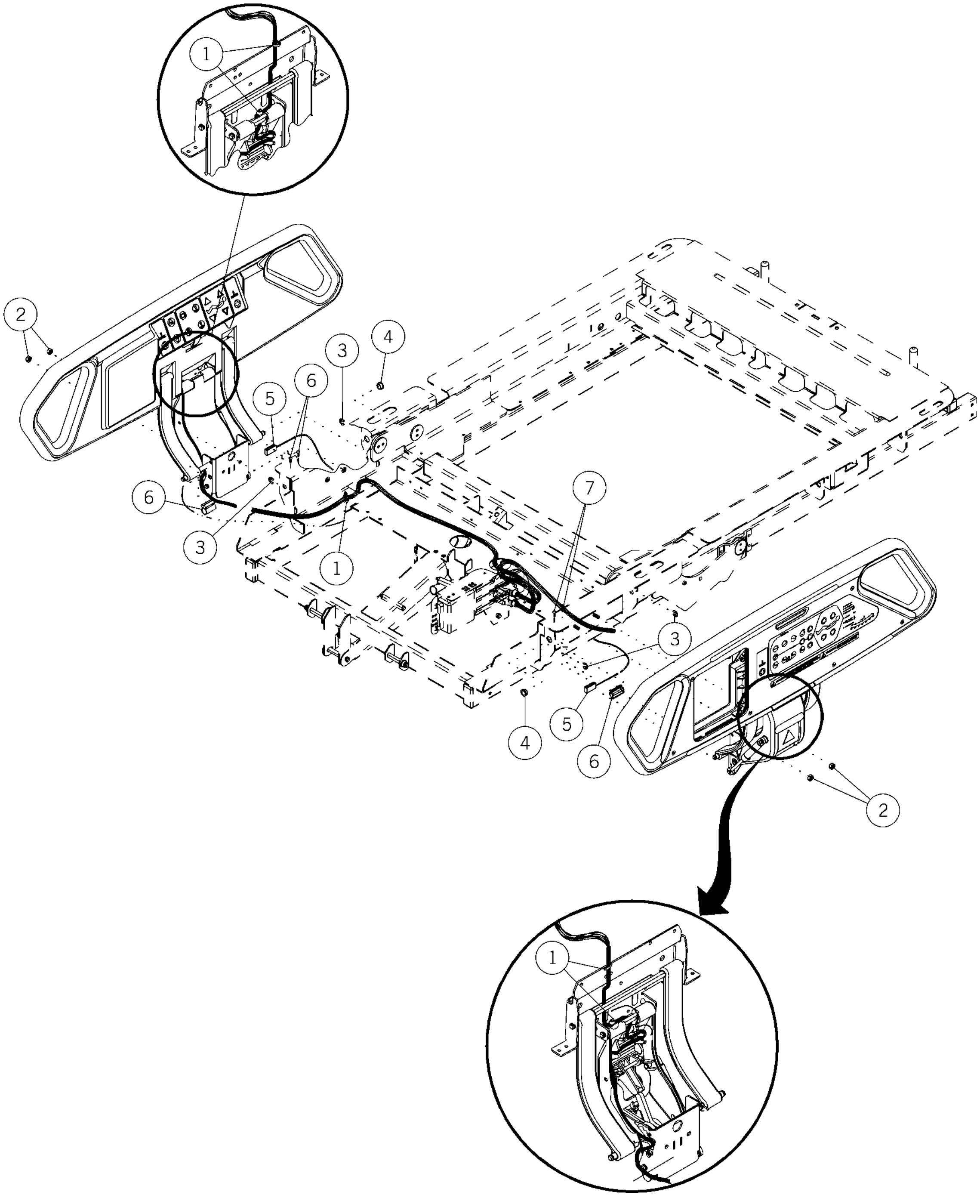

Table 5-13. Intermediate Siderail Assembly—Installation and Cable Routing

Item Number	Part Number	Quantity	Description
1	19124 (1900)	5	Large cable tie
2	20802 (1900)**	2	Keps nut
3	3532501 (1900)**	2	Retaining ring
4	36570 (1900)**	1	Oilite®[a] bushing
5	6548801 (1900)**	1	Intermediate siderail detection switch (siderail with intermediate siderail detection switch option only)
6	65465 (1900)**	1	Magnet assembly (siderail with intermediate siderail detection switch option only)
7	65614 (1900)**	2	#6-32 x 0.375 screw with patch (siderail with intermediate siderail detection switch option only)

a. Oilite® is a registered trademark of Beemer Precision, Incorporated.

** Quantities shown are per siderail.

Headboard Assembly—P1921B

Figure 5-14. Headboard Assembly—P1921B

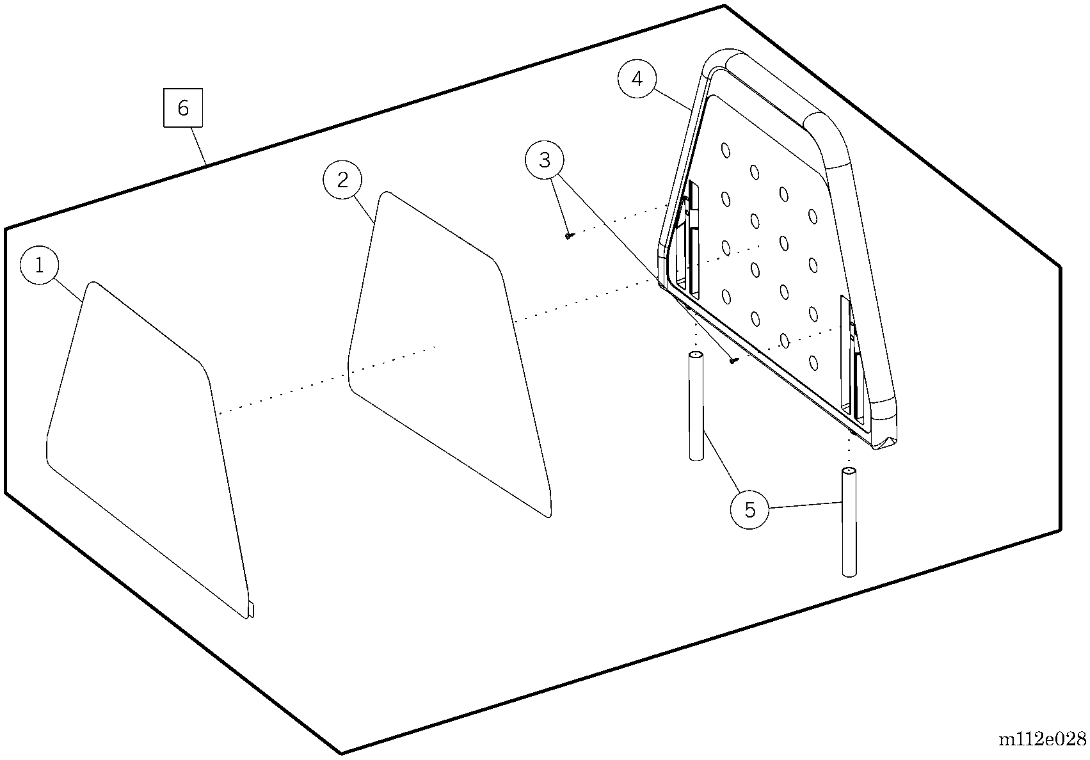

Table 5-14. Headboard Assembly—P1921B

Item Number	Part Number	Quantity	Description
1	69169 (1900)*	1	High pressure laminate (HPL) insert, headboard
2	69168 (1900)	1	Adhesive, headboard
3	90038-02 (1900)	2	Screw
4	68699 (1900)	1	Panel, head
5	69167 (1900)	2	Tube, mounting, headboard
6	P1921B (1900)	1	Head panel

* Specify high pressure laminate color.

Footboard Module—P1922

Figure 5-15. Footboard Module—P1922

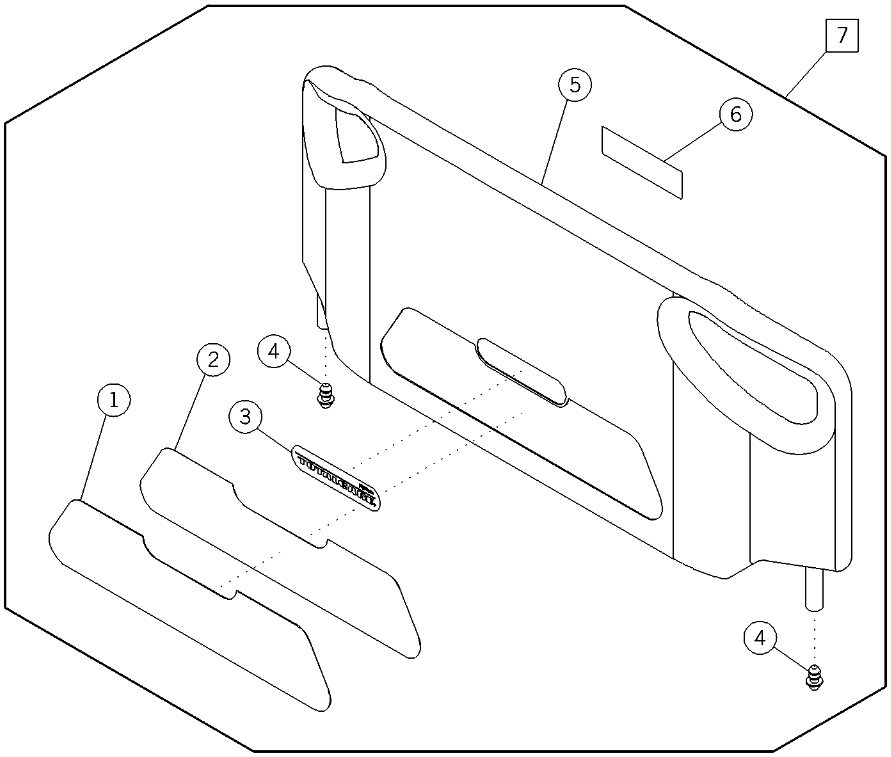

Table 5-15. Footboard Module—P1922

Item Number	Part Number	Quantity	Description
1	49510 (1900)*	1	High pressure laminate insert, footboard
2	49511 (1900)	1	Adhesive footboard
3	49513 (1900)	1	Nameplate
4	406370148 (1900)	2	End cap
5	64144 (1900)	1	Panel, foot
6	49491 (1900)	1	Label, stand or sit caution
7	P1922A$$$	1	Footboard assembly, complete

* Specify high pressure laminate color.

Transport Shelf Module—P1923

Figure 5-16. Transport Shelf Module—P1923

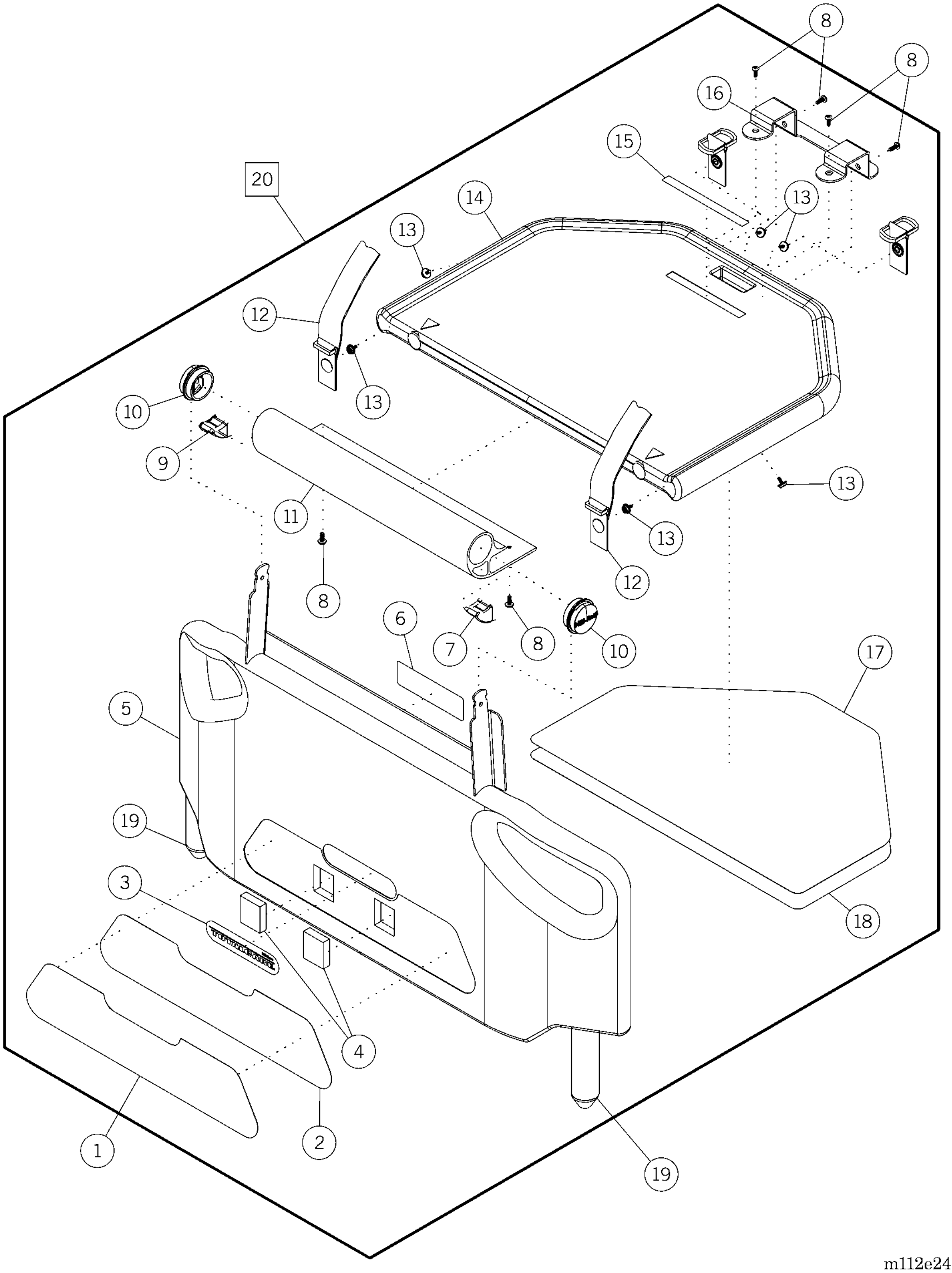
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Table 5-16. Transport Shelf Module—P1923

Item Number	Part Number	Quantity	Description
1	49510 (1900)*	1	High pressure laminate insert, footboard
2	49511 (1900)	1	Adhesive footboard
3	49513 (1900)	1	Nameplate
4	49528 (1900)	2	Magnet
5	6414401 (1900)	1	Shelf foot panel
6	49491 (1900)	1	Label, stand or sit caution
7	6474901 (1900)	1	Plug, shelf extrusion lh
8	46260 (1900)	6	Screw
9	6474902 (1900)	1	Plug, shelf extrusion rh
10	4345501 (1900)	2	Hub
11	49523 (1900)	1	Extrusion
12	49532 (1900)	2	Utility strap
13	62628 (1900)	6	Male snap
14	49527 (1900)	1	Utility shelf
15	49530 (1900)	1	Label group
16	4953148 (1900)	1	Handle bracket
17	49462 (1900)	1	Adhesive headboard
18	49472 (1900)*	1	High pressure laminate insert, headboard
19	406370148 (1900)	2	End cap
20	P1923$$$	1	Transport shelf assembly, complete

* Specify high pressure laminate color.

Hydraulic System Module

Figure 5-17. Hydraulic System Module

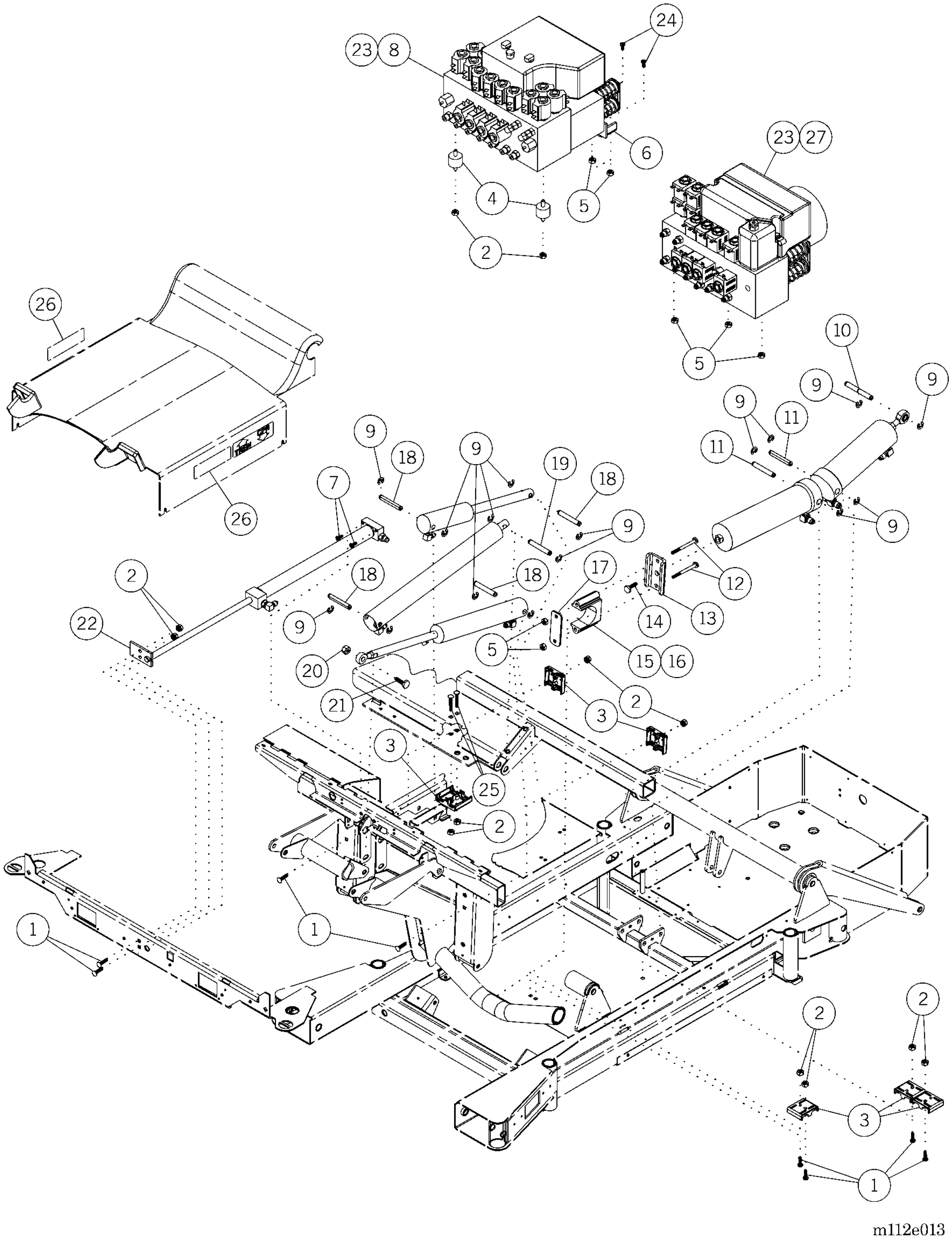
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Table 5-17. Hydraulic System Module

Item Number	Part Number	Quantity	Description
1	4582201 (1900)	8	Round square neck bolt
2	20802 (1900)	10	Keps nut
3	47198 (1900)	3	Clamp, hose/cable
4	49143 (1900)	2	Mount, isolation, neoprene (P1900A and P1900B models only)
5	4435 (1900)	4 or 5	Locknut
6	4719748 (1900)	1	Bracket, hydraulic power unit support (P1900A and P1900B models only)
7	64765 (1900)	2	Screw, ¼"-20 low profile
8	4918120 (1900)	1	Manifold assembly (North American 120V P1900A and P1900B models without foot pump only)
	4918121 (1900)	1	Manifold assembly (North American 120V P1900A and P1900B models with foot pump only)
	4918130 (1900)	1	Hydraulic power unit without foot pump (230V P1900A and P1900B models without foot pump only)
	4918131 (1900)	1	Hydraulic power unit with foot pump (230V P1900A and P1900B models with foot pump only)
9	35325 (1900)	16	E-ring
10	4727103pl (1900)	1	D-pin
11	4727109pl (1900)	2	D-pin
12	9001844 (1900)	2	Screw, hex cap
13	4913048 (1900)	1	Channel, hilow foot cylinder
14	49166 (1900)	1	Hex cap screw
15	47238 (1900)	1	Block, hilow foot cylinder bearing
16	SA3351 (1900)	As required	4 oz. lithium grease
17	47237pl (1900)	1	Plate, hilow foot cylinder
18	4727105pl (1900)	4	D-pin

Item Number	Part Number	Quantity	Description
19	4727107pl (1900)	1	D-pin
20	49200 (1900)	1	Hex stop nut
21	90017-20 (1900)	1	Bolt
22	47199 (1900)	1	Plate, cylinder retainer
23	36199s (1900)	As required	Hydraulic fluid—quart
24	49521 (1900)	2	¼"-20 x 5/8" six-lobe Torx®[a] screw
25	4582203 (1900)	2	Round square neck bolt
26	49487 (1900)	1	Emergency Trendelenburg warning label (North American 120V model without foot pump only)
27	6543020 (1900)	1	Hydraulic power unit (North American 120V P1900C and P1900D models without foot pump only)
	6543021 (1900)	1	Hydraulic power unit (North American 120V P1900C and P1900D models with foot pump only)
	6543030 (1900)	1	Hydraulic power unit (230V P1900C and P1900D models without foot pump only)
	6543031 (1900)	1	Hydraulic power unit (230V 1900C and P1900D models with foot pump only)

a. Torx® is a registered trademark of Textron, Inc.

NOTES:

Hilow Cylinder Brace Kit—SA1695

Figure 5-18. Hilow Cylinder Brace Kit—SA1695

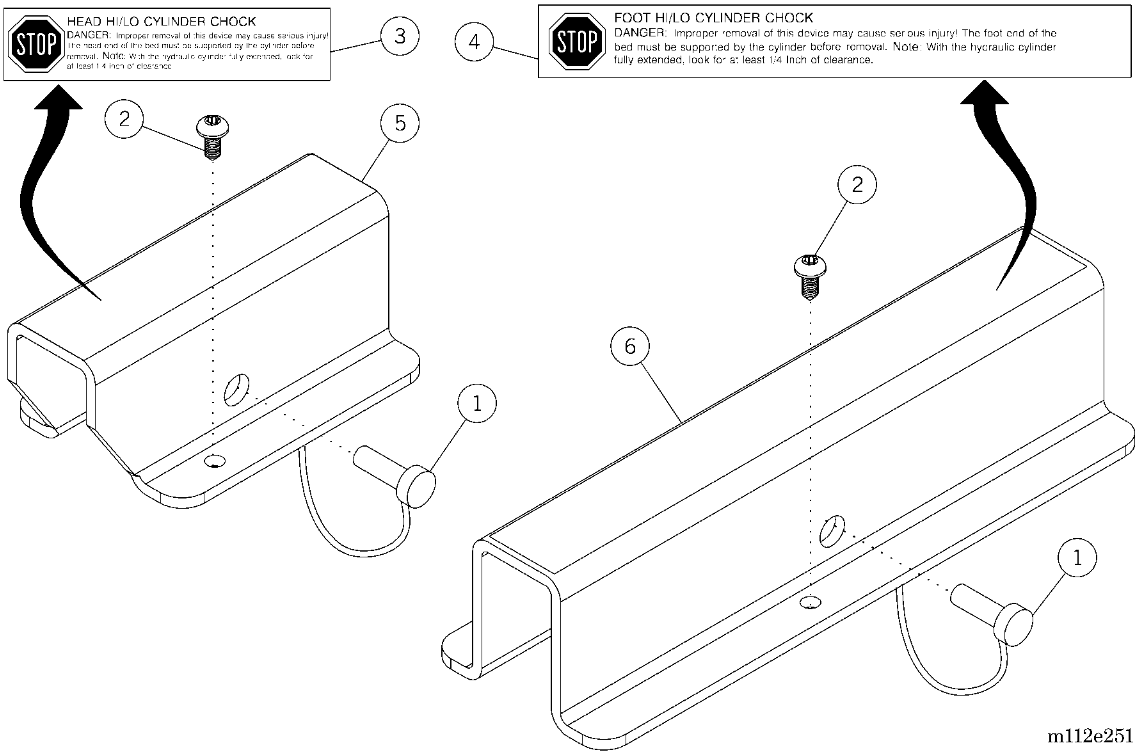
STOP
HEAD HI/LO CYLINDER CHOCK
DANGER: Improper removal of this device may cause serious injury! The head end of the bed must be supported by the cylinder before removal. Note: With the hydraulic cylinder fully extended, look for at least 1/4 inch of clearance.
3
4
STOP
FOOT HI/LO CYLINDER CHOCK
DANGER: Improper removal of this device may cause serious injury! The foot end of the bed must be supported by the cylinder before removal. Note: With the hydraulic cylinder fully extended, look for at least 1/4 Inch of clearance.
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Table 5-18. Hilow Cylinder Brace Kit—SA1695

Item Number	Part Number	Quantity	Description
1	36832 (1900)	2	Ball lock pin
2	43878 (1900)	2	Torx®[a] button head screw
3	6561501 (1900)	1	Warning label, hilow head cylinder
4	6561502 (1900)	1	Warning label, hilow foot cylinder
5	654840154 (1900)	1	Brace, hilow head cylinder safety
6	654840254 (1900)	1	Brace, hilow foot cylinder safety

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NOTES:

Hydraulic System Foot Pump

Figure 5-19. Hydraulic System Foot Pump

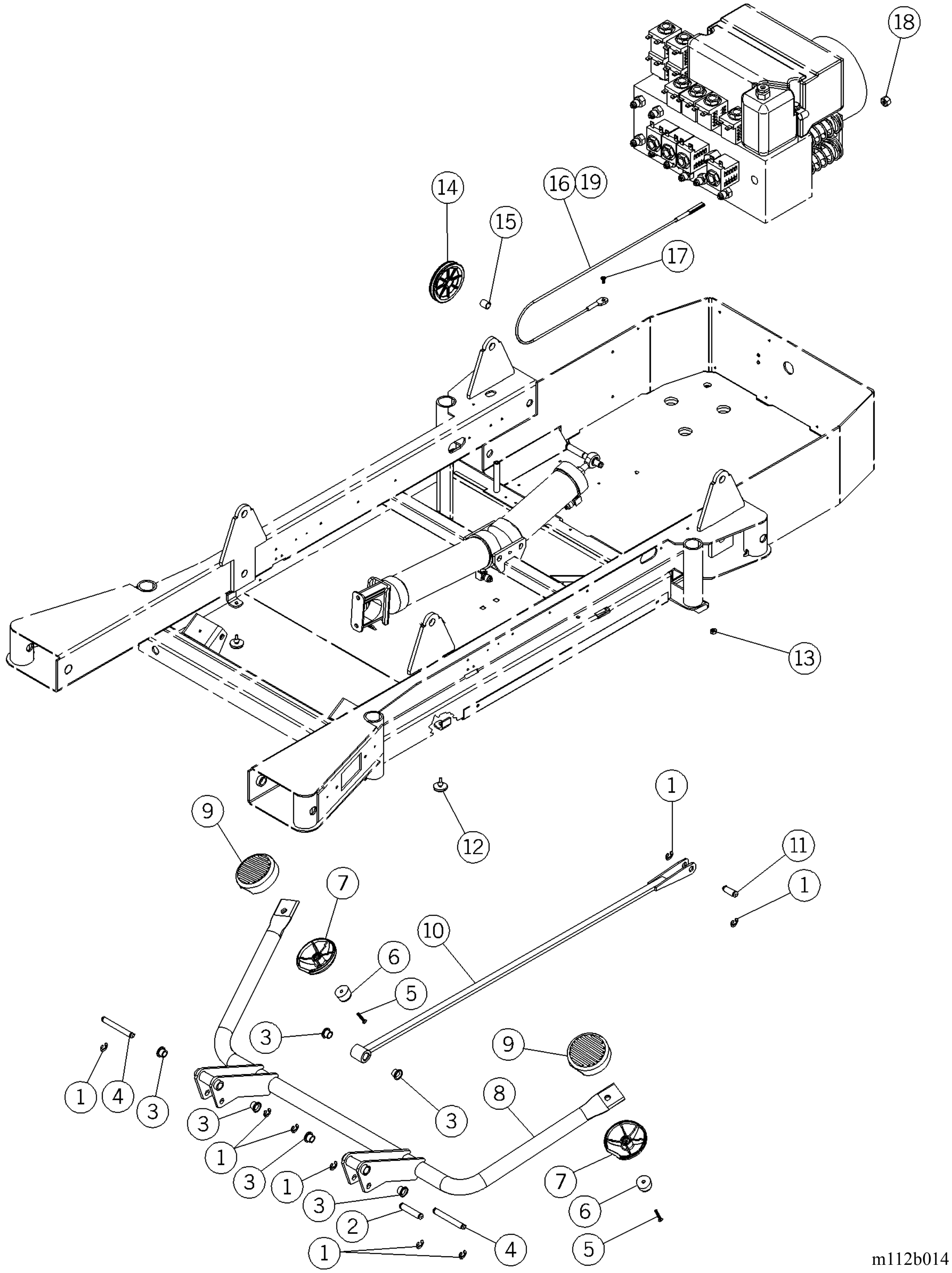
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Table 5-19. Hydraulic System Foot Pump

Item Number	Part Number	Quantity	Description
1	35325 (1900)	8	E-ring
2	4727106pl (1900)	1	D-pin
3	90340-06 (1900)	6	DU Flange bushing
4	4727104pl (1900)	2	D-pin
5	42140 (1900)	2	Screw
6	33603 (1900)	2	Bumper
7	4917265 (1900)	2	Cap, foot pump pedal bottom
8	4716848 (1900)	1	Weldment, foot pump pedal
9	4917165 (1900)	2	Pad, foot pump pedal top
10	4716948 (1900)	1	Weldment, foot pump linkage
11	4727108pl (1900)	1	D-pin
12	41344 (1900)	2	Plug bumper
13	4435 (1900)	1	Locknut
14	47247 (1900)	1	Sheave, foot pump cable
15	9026309 (1900)	1	Sleeve bearing
16	47246 (1900)	1	Cable assembly, foot pump (P1900A and P1900B models with foot pump only)
17	49521 (1900)	1	¼"-20 x 5/8" six-lobe Torx®[a] screw
18	49200 (1900)	1	Hex stop nut
19	4724601 (1900)	1	Cable assembly, foot pump (P1900C model with foot pump only)

[a] Torx® is a registered trademark of Textron, Inc.

Hydraulic System Manifold (P1900A and P1900B Models Only)

Figure 5-20. Hydraulic System Manifold (P1900A and P1900B Models Only)

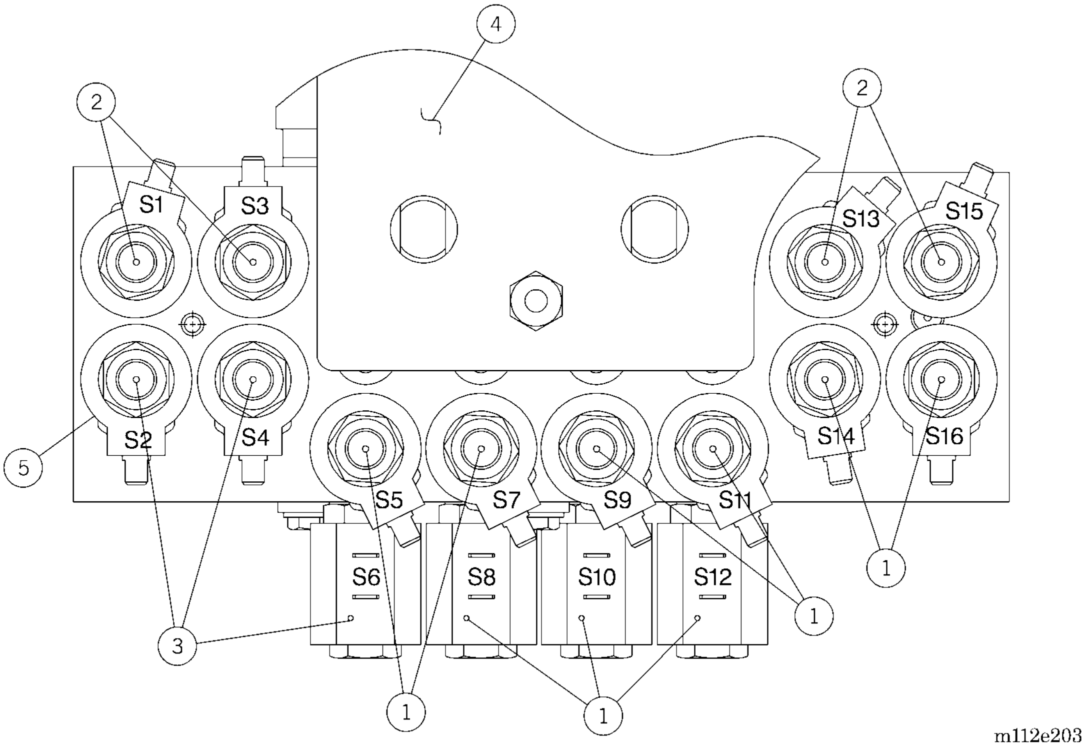

Table 5-20. Hydraulic System Manifold (P1900A and P1900B Models Only)

Item Number	Part Number	Quantity	Description
1	4918136 (1900)	9	Valve solenoid cartridge
2	4918134 (1900)	4	Valve solenoid cartridge
3	4918135 (1900)	3	Valve solenoid cartridge
4	36199s (1900)	As required	Hydraulic fluid—quart
5	4918132 (1900)	16	Coil
6 (not shown)	4918138 (1900)	1	CPR valve
7 (not shown)	4918139 (1900)	1	Emergency Trendelenburg valve

Hydraulic System Manifold (P1900C and P1900D Models Only)

Figure 5-21. Hydraulic System Manifold (P1900C and P1900D Models Only)

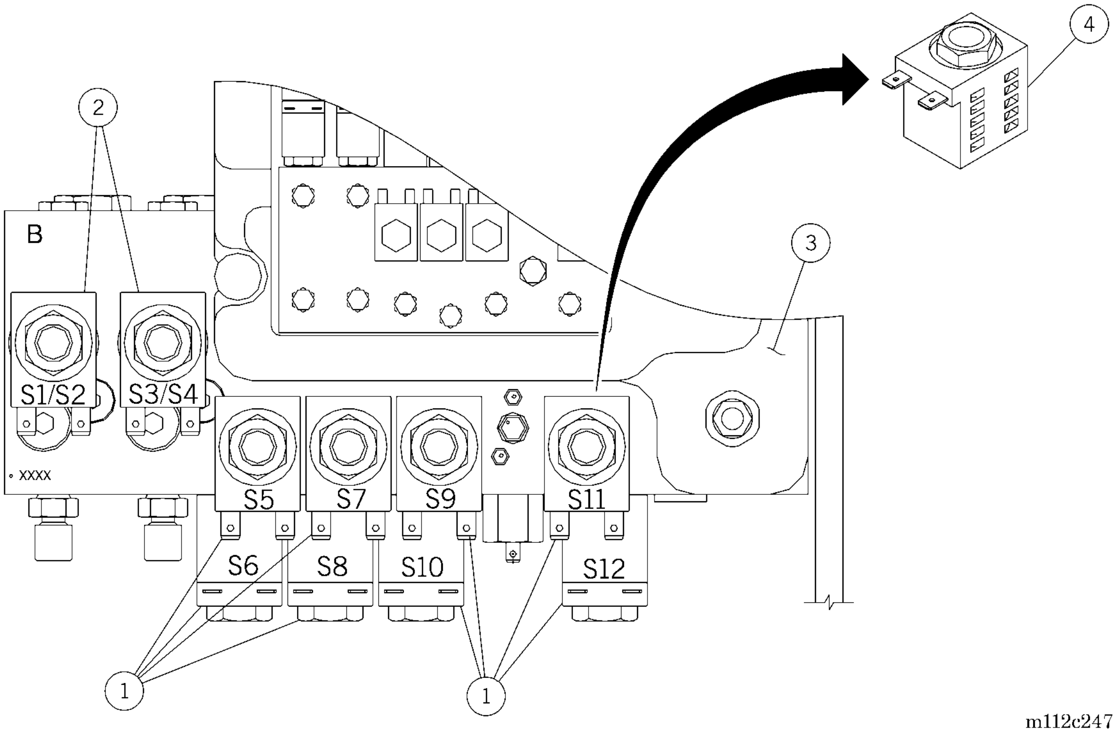

Table 5-21. Hydraulic System Manifold (P1900C and P1900D Models Only)

Item Number	Part Number	Quantity	Description
1	6543035 (1900)	8	Valve guide tube
2	6543034 (1900)	2	Valve solenoid cartridge
3	36199s (1900)	As required	Hydraulic fluid—quart
4	6543032 (1900)	12	Coil
5 (not shown)	6543038 (1900)	2	CPR and Emergency Trendelenburg valve
6 (not shown)	67905 (1900)	8	Pilot operated check valve
	69365 (1900)	8	Valve, pilot (for use on beds with serial number C305AMXXXX and later)
7 (not shown)	6543042 (1900)	1	Breather cap

Hydraulic System Module—Hose and Cylinder Assemblies (P1900A and P1900B Models Only)

Figure 5-22. Hydraulic System Module—Hose and Cylinder Assemblies (P1900A and P1900B Models Only)

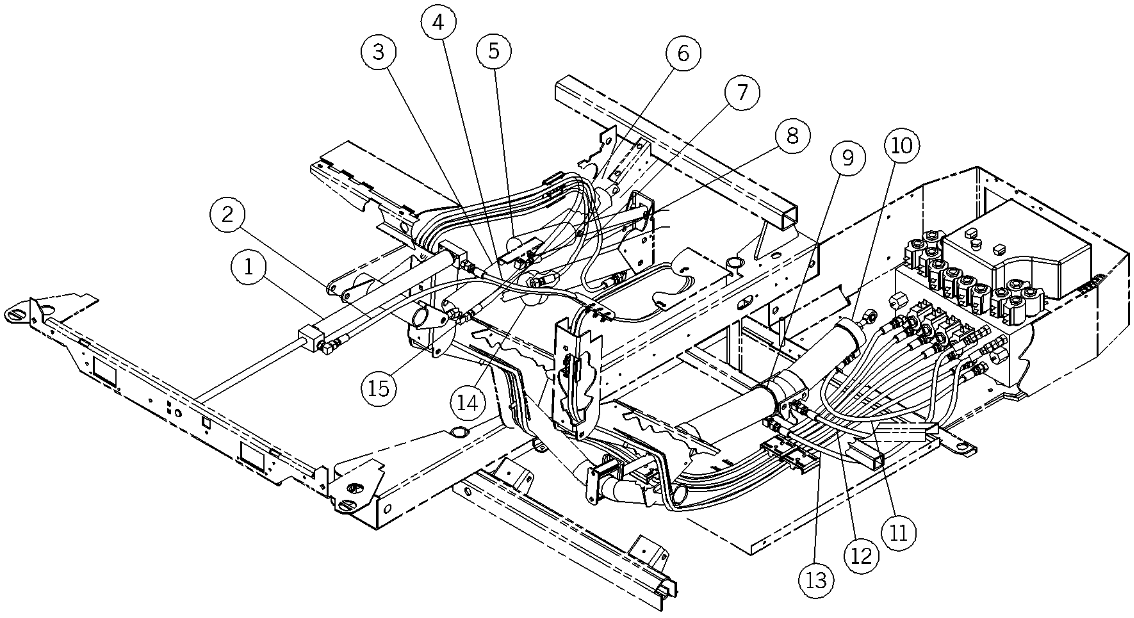

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Table 5-22. Hydraulic System Module—Hose and Cylinder Assemblies (P1900A and P1900B Models Only)

Item Number	Part Number	Quantity	Description
1	4918117 (1900)	1	Cylinder assembly, foot retraction (hydraulic)
2	4918106 (1900)	1	Hose assembly, foot retraction cylinder (rod end)
3	6543014 (1900)	1	Cylinder assembly, head hydraulic
4	4918105 (1900)	1	Hose assembly, foot retraction cylinder (blind end)
5	6543013 (1900)	1	Cylinder assembly, knee hydraulic
6	4918102 (1900)	1	Hose assembly, knee cylinder
7	4918104 (1900)	1	Hose assembly, foot articulation cylinder (rod end)
8	4918103 (1900)	1	Hose assembly, foot articulation cylinder (blind end)
9	4918116 (1900)	1	Cylinder assembly, hilow foot hydraulic (black)
	6543016 (1900)	1	Cylinder assembly, hilow foot hydraulic (silver)
10	4918115 (1900)	1	Cylinder assembly, hilow head hydraulic (black)
	6543015 (1900)	1	Cylinder assembly, hilow head hydraulic (silver)
11	4918107 (1900)	1	Hose assembly, hilow head cylinder (rod end)
12	4918109 (1900)	1	Hose assembly, hilow head cylinder (blind end)
13	4918108 (1900)	1	Hose assembly, hilow foot cylinder
14	6543012 (1900)	1	Cylinder assembly, foot articulation hydraulic
15	4918101 (1900)	1	Hose assembly, head cylinder

Hydraulic System Module—Hose and Cylinder Assemblies (P1900C and P1900D Models Only)

Figure 5-23. Hydraulic System Module—Hose and Cylinder Assemblies (P1900C and P1900D Models Only)

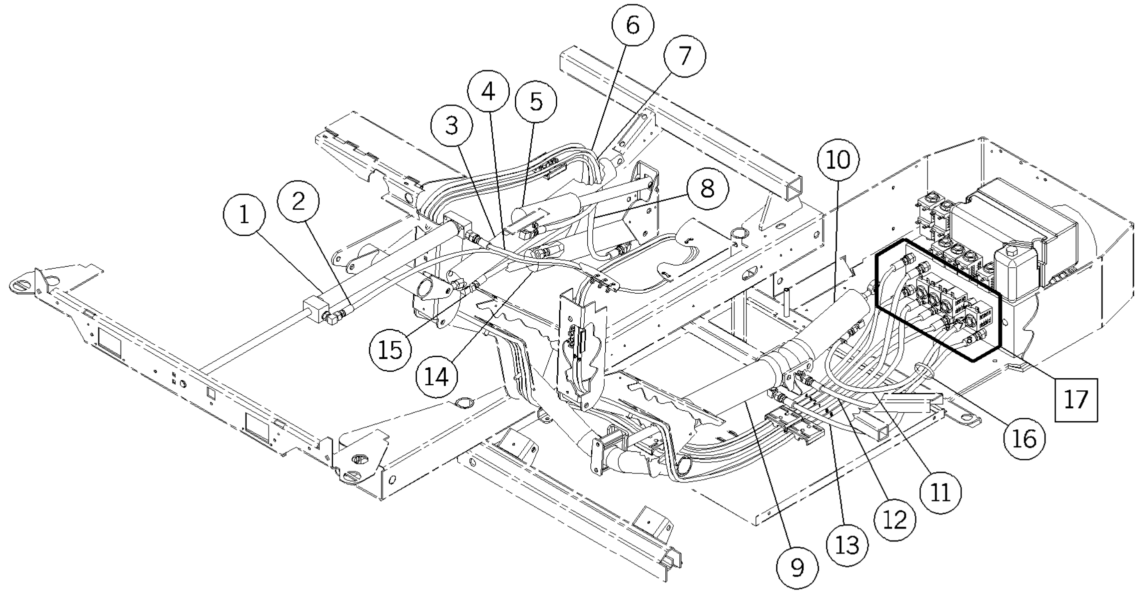

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Table 5-23. Hydraulic System Module—Hose and Cylinder Assemblies (P1900C and P1900D Models Only)

Item Number	Part Number	Quantity	Description
1	4918117 (1900)	1	Cylinder assembly foot retraction (hydraulic)
2	6543006 (1900)	1	Hose assembly foot retraction cylinder (rod end)
3	6543014 (1900)	1	Cylinder assembly head hydraulic
4	6543005 (1900)	1	Hose assembly foot retraction cylinder (blind end)
5	6543013 (1900)	1	Cylinder assembly knee hydraulic
6	6543002 (1900)	1	Hose assembly, knee cylinder
7	6543004 (1900)	1	Hose assembly foot articulation cylinder (rod end)
8	6543003 (1900)	1	Hose assembly foot articulation cylinder (blind end)
9	6543016 (1900)	1	Cylinder assembly hilow foot hydraulic
10	6543015 (1900)	1	Cylinder assembly hilow head hydraulic
11	6543007 (1900)	1	Hose assembly hilow head cylinder (rod end)
12	6543009 (1900)	1	Hose assembly hilow head cylinder (blind end)
13	6543008 (1900)	1	Hose assembly hilow foot cylinder
14	6543012 (1900)	1	Cylinder assembly foot articulation hydraulic
15	6543001 (1900)	1	Hose assembly head cylinder
16	19124 (1900)	1	Large cable tie
17	6543000 (1900)	1	Hose kit, hydraulic cylinder

Power Control Module

Figure 5-24. Power Control Module

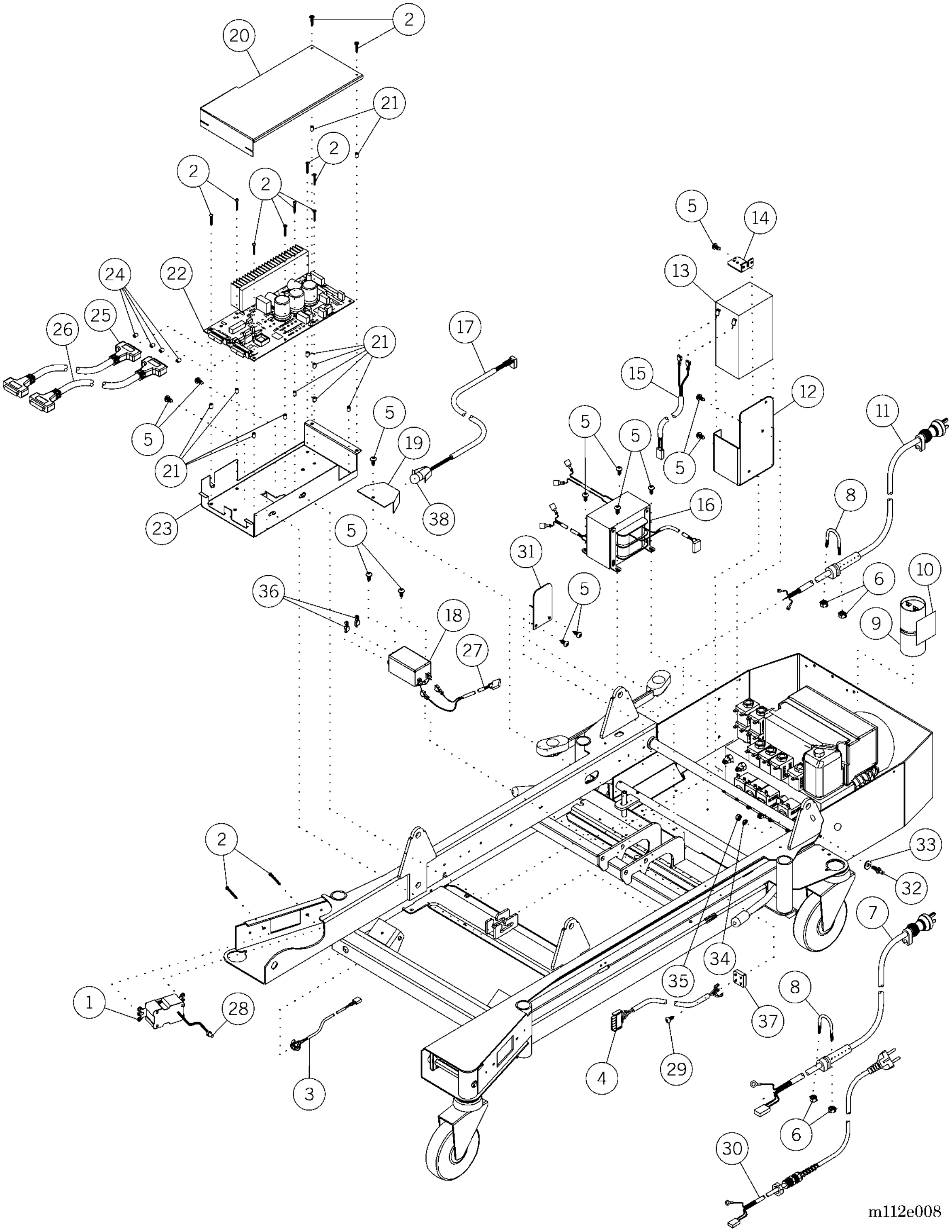
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Table 5-24. Power Control Module

Item Number	Part Number	Quantity	Description
1	4735801 (1900)	1	Connector, receptacle, duplex (120V accessory AC receptacle model only)
2	49508 (1900)	10 or 12	Screw
3	68742 (1900)	1	Night light sensor/cable assembly (night light model only)
4	4734001 (1900)	1	Cable assembly bridge
5	43878 (1900)	26 or 27	Torx®[a] button head screw
6	11247 (1900)	2 or 4	Nut
7	4733601 (1900)	1	Cable assembly, line cord (North American model only)
8	49179 (1900)	1 or 2	U-bolt
9	6006201 (1900)	1	Capacitor, motor (110V/120V/127V model only)
	6359701 (1900)	1	Capacitor, motor, 440V (220V/230V/240V model only)
	71547 (1900)	1	Capacitor, motor, 250V AC (100V model only)
10	64565 (1900)	1	Cable tie mount, adhesive back
11	4738701 (1900)	1	Cable assembly, accessory AC receptacle (accessory AC receptacle model only)
12	4947448	1	Bracket, battery (battery model only) ("A" or "B" model only)
	6616548	1	Bracket, battery (battery model only) ("C" model only)
13	4840501 (1900)	1	Battery, lead acid, sealed (battery model only)
14	47293pl (1900)	1	Sensor mounting bracket, head lift (battery model only)
15	4734901 (1900)	1	Cable assembly, battery (battery model only)
16	4704301 (1900)	1	Transformer assembly (120V)
	70918 (1900)	1	Transformer assembly, 220V/230V/240V
	70919 (1900)	1	Transformer assembly, 100V/110V/127V

a. Torx® is a registered trademark of Textron, Inc.

Item Number	Part Number	Quantity	Description
17	4853601 (1900)	1	Cable assembly, night light (night light model only)
18	41439-10 (1900)	1	Filter, power line (power line filter **without** air module only)
	3084201 (1900)	1	Filter, power line, 10A (power line filter **with** air module only)
19	49175pl (1900)	1	Enclosure, night light (night light model only)
20	47224pl (1900)	1	Cover, power/control P.C. board
21	49164 (1900)	11	Long plastic spacer
22	4704101 (1900)	1	Power/control P.C. board assembly (110V/120V/127V model only)
	4704102 (1900)	1	Power/control P.C. board assembly, 230V (220V/230V/240V model only)
23	47223pl (1900)	1	Enclosure, power/control P.C. board
24	42006 (1900)	4	Screw lock
25	4853801 (1900)	1	Cable assembly, power distribution
26	4851001 (1900)	1	Cable assembly, signal distribution
27	4733701 (1900)	1	Cable assembly, AC power
	70922 (1900)	1	Cable assembly, 127V/240V
	70920 (1900)	1	Cable assembly, 100V/220V
	70921 (1900)	1	Cable assembly, AC, 110V/230V
28	32741 (1900)	1	Wire joint
29	63166 (1900)	1	Lobe, special head type, #23 screw

Item Number	Part Number	Quantity	Description
30	6351201 (1900)	1	Cable assembly, Continental Europe
	6351202 (1900)	1	Cable assembly, Switzerland
	6351203 (1900)	1	Cable assembly, United Kingdom
	6351204 (1900)	1	Cable assembly, Australia
	6351208 (1900)	1	Cable assembly, AC, Japan
	6351209 (1900)	1	Cable assembly, AC, Taiwan
	6351210 (1900)	1	Cable assembly, AC, China
	6351206 (1900)	1	Cable assembly, AC, Italy
	6351205 (1900)	1	Cable assembly, AC, Denmark
	6351207 (1900)	1	Cable assembly, AC, Saudi Arabia
31	4714948 (1900)	1	Barrier, high voltage
32	44125 (1900)	1	Plug (230V model only)
33	44127 (1900)	1	Washer, color-coded green/yellow (230V model only)
34	44128 (1900)	1	Washer, serrated lock (230V model only)
35	44126 (1900)	1	Nut (230V model only)
36	3084501 (1900)	2	Faston®[a] tab adapter (power line **with** air module model only)
37	4840401 (1900)	1	Diode, rectifier, 25A, 100A, D34A
38	4734501 (1900)	1	Lamp, miniature incandescent, 13.5V, 0.59A

[a] Faston® is a registered trademark of The Whitaker Corporation.

Power Control Module—Labels and Cover Assemblies

Figure 5-25. Power Control Module—Labels and Cover Assemblies

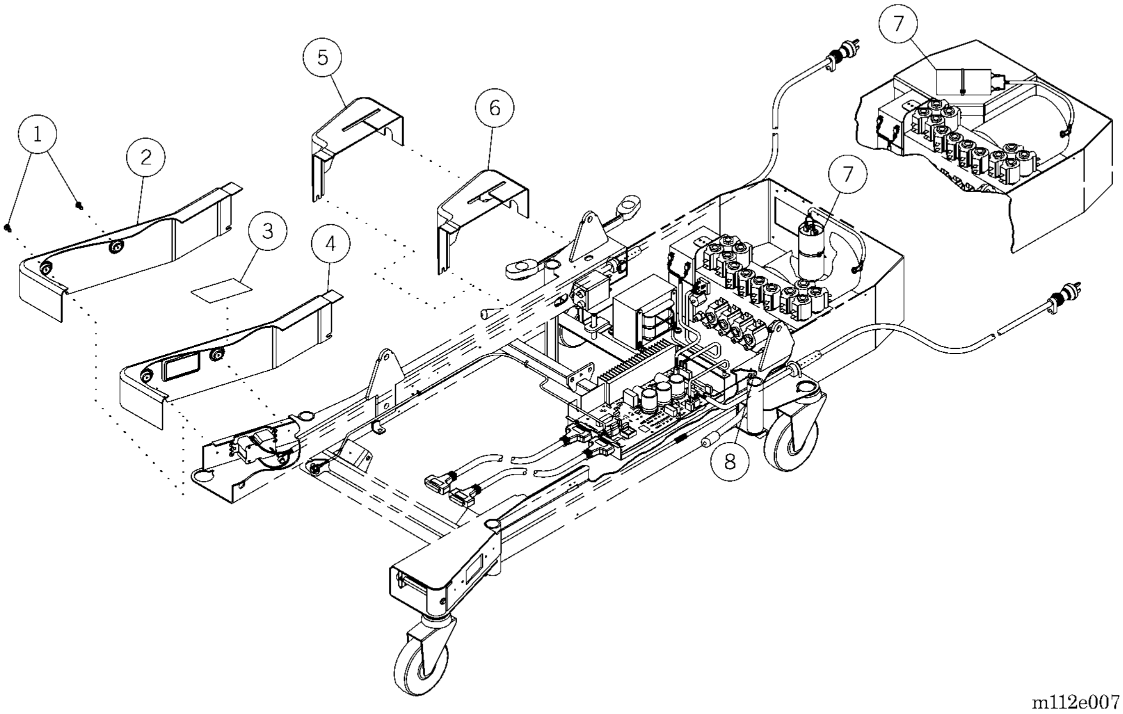

Table 5-25. Power Control Module—Labels and Cover Assemblies

Item Number	Part Number	Quantity	Description
1	47172 (1900)	2	Screw #10-32 x 5/8" tapping
2	4917002 (1900)	1	Cover, rh foot base (model without accessory AC receptacle only)
3	49489 (1900)	1	Label, receptacle capacity (accessory AC receptacle model only)
4	491700448 (1900)	1	Cover, rh foot end base (accessory AC receptacle model only)
5	4916902(1900)	1	Cover, rh head end base (model without accessory AC receptacle only)
6	491690448 (1900)	1	Cover, rh head base (accessory AC receptacle model only)
7	19124 (1900)	4	Large cable tie
8	44002 (1900)	1	Label protective earth

NOTES:

Power Control Module—Bed Solenoid Cable Routing

Figure 5-26. Power Control Module—Bed Solenoid Cable Routing

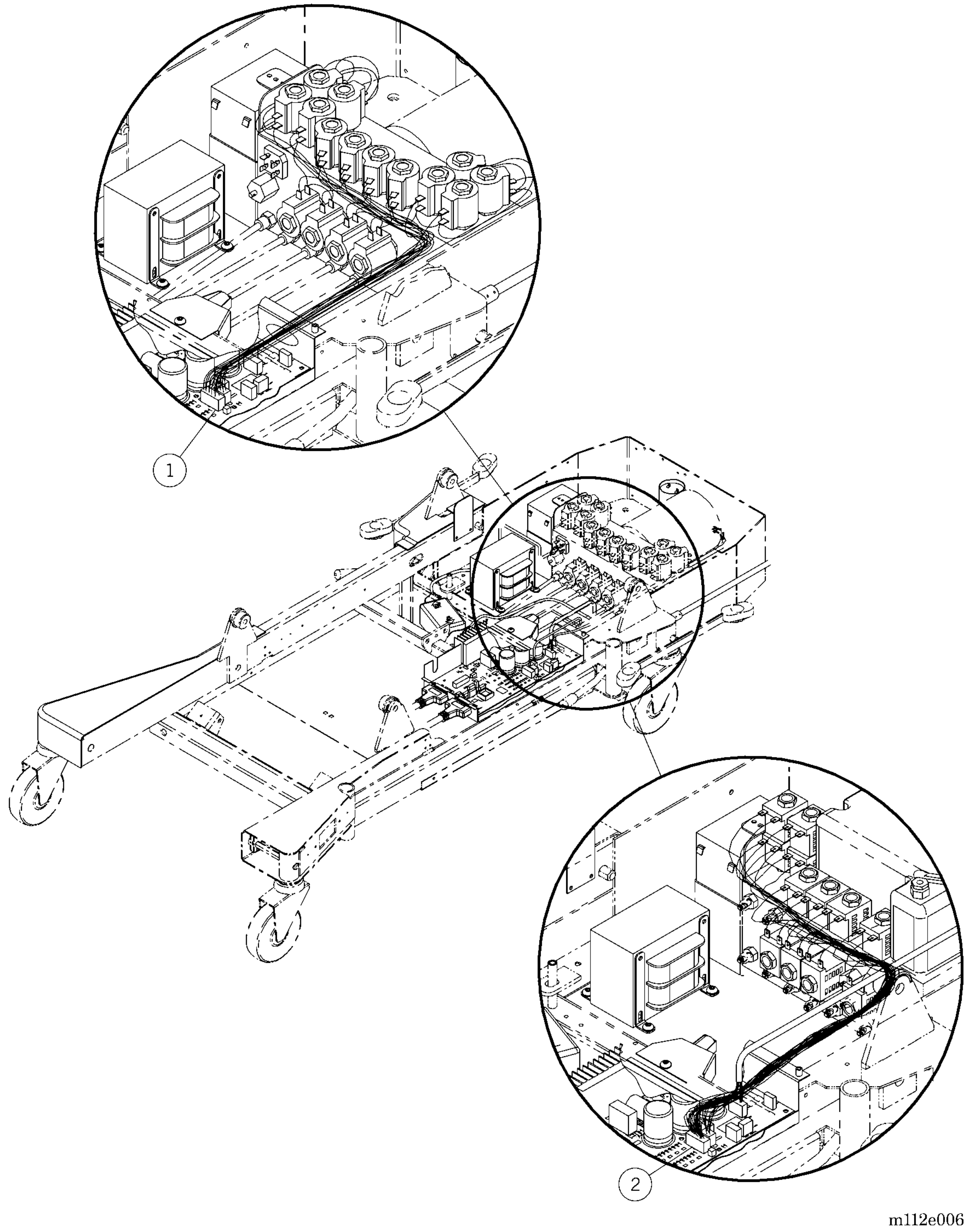

Table 5-26. Power Control Module—Bed Solenoid Cable Routing

Item Number	Part Number	Quantity	Description
1	4734201 (1900)	1	Cable assembly, bed solenoid (1900A and 1900B models only)
2	6616601 (1900)	1	Cable assembly, bed solenoid (1900C and later models only)

Power Control Module—Signal/Power Distribution Ground Strap Assemblies

Figure 5-27. Power Control Module—Signal/Power Distribution Ground Strap Assemblies

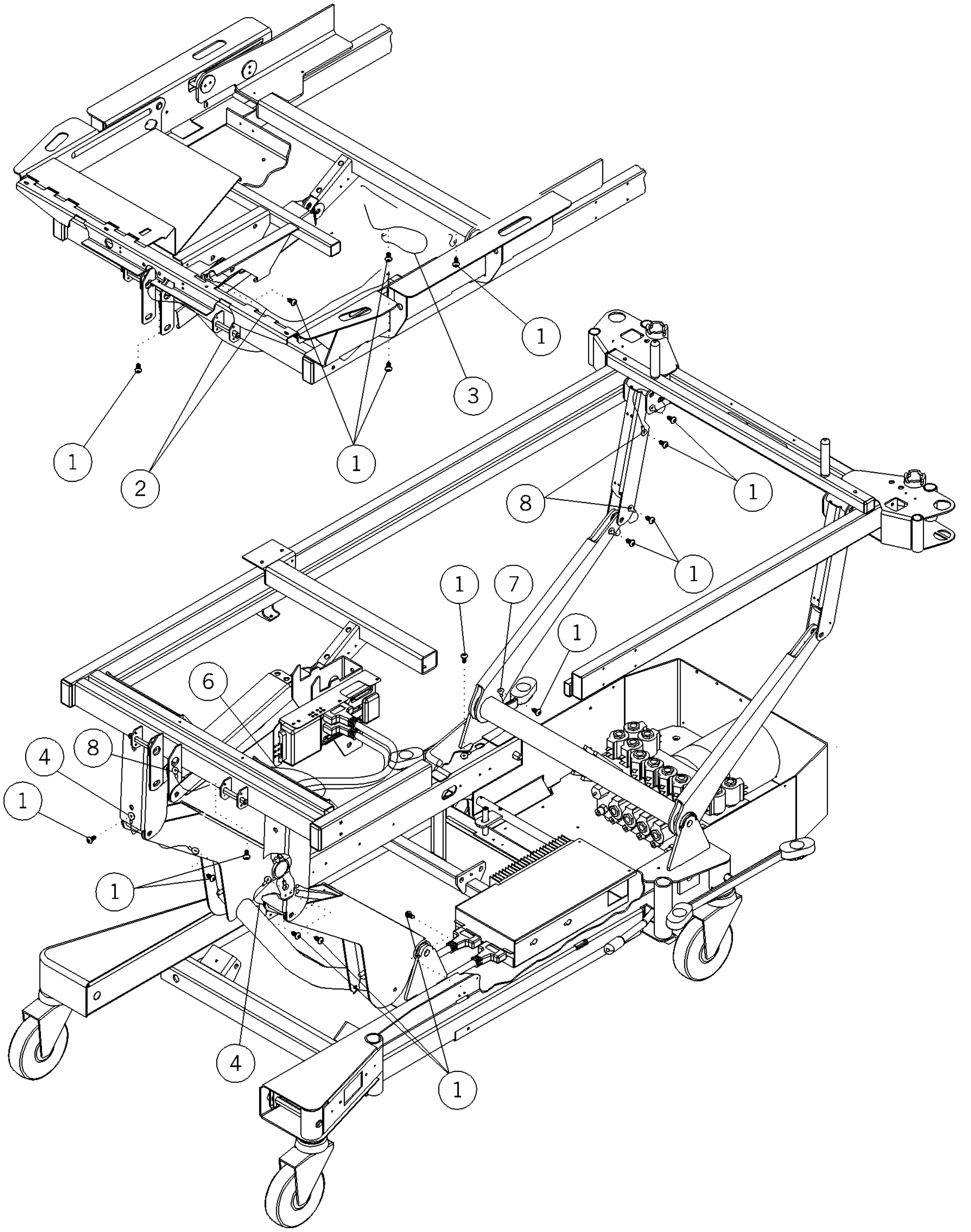

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Table 5-27. Power Control Module—Signal/Power Distribution Ground Strap Assemblies

Item Number	Part Number	Quantity	Description
1	43878 (1900)	17	Torx®[a] button head screw
2	3924016 (1900)	2	Ground strap assembly, 27"
3	39240-02 (1900)	1	Ground strap
4	3924008 (1900)	2	Ground strap assembly
5			
6	3924015 (1900)	1	Ground strap assembly, 48"
7	3924017 (1900)	1	Ground strap assembly, 5.5"
8	3924004 (1900)	3	Ground strap assembly

[a] Torx® is a registered trademark of Textron, Inc.

Scale Module

Figure 5-28. Scale Module

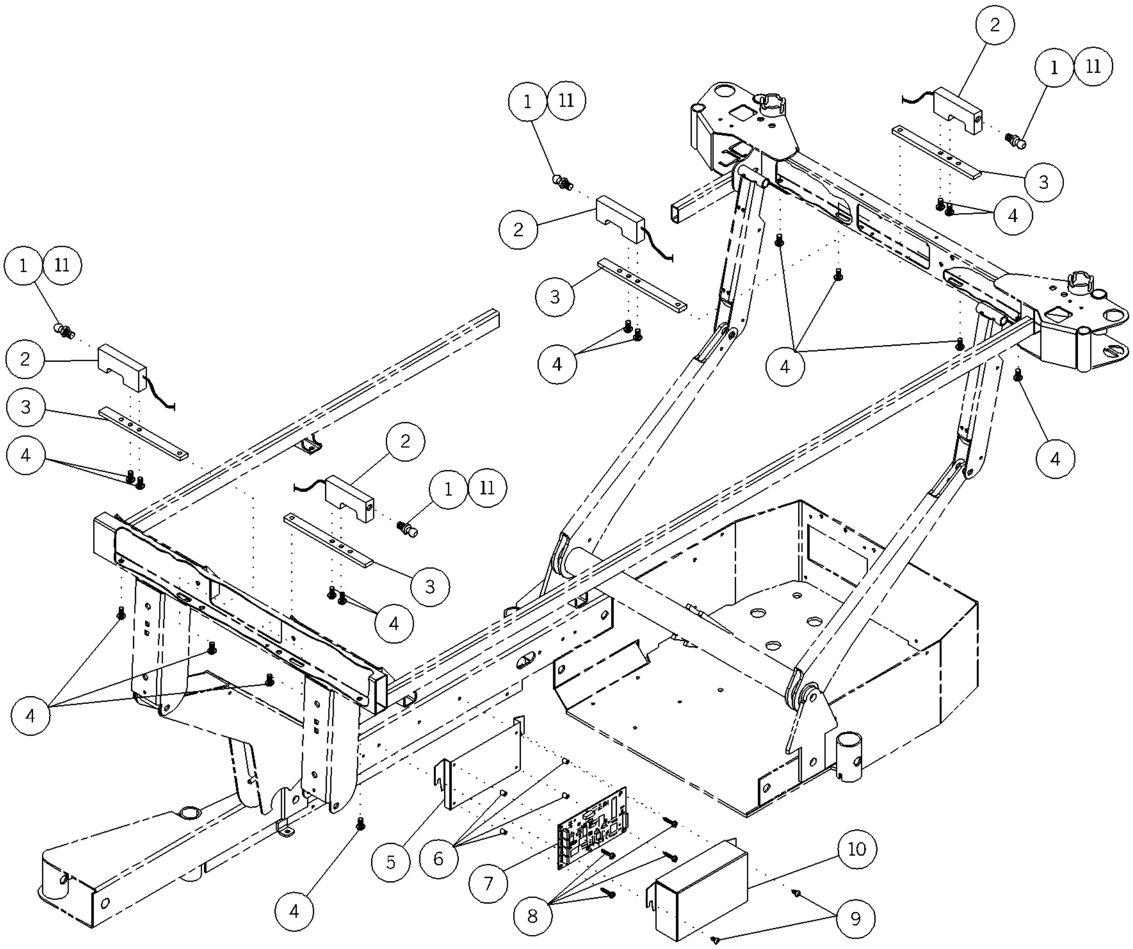
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Table 5-28. Scale Module

Item Number	Part Number	Quantity	Description
1	38052 (1900)	4	Ball stud—gas cylinder, critical care unit (for load beam)
2	4853101 (1900)	4	Med 400 Jr beam (standard scale beds only)
	4853104 (1900)	4	Load beam Jr—74" cable length (OIML scale beds only)
3	47135pl (1900)	4	Plate, load beam mount intermediate frame
4	49521 (1900)	16	¼"-20 x 5/8" six-lobe Torx®[a] screw
5	47227pl (1900)	1	Bracket, scale P.C. board
6	49164 (1900)	4	Long plastic spacer
7	4703801 (1900)	1	P.C. board, scale, TotalCare® Bed System (standard scale bed only)
	67761 (1900)	1	OIML scale P.C. board assembly (OIML scale beds only)
8	49508 (1900)	1	Screw, formed, hex washer
9	43878 (1900)	2	Torx® button head screw
10	47228pl (1900)	1	Cover, scale P.C. board
11	8328 (1900)	As required	8 oz. Loctite®[b] adhesive

a. Torx® is a registered trademark of Textron, Inc.
b. Loctite® is a registered trademark of Loctite Corporation.

Scale Module—Cable Routing

Figure 5-29. Scale Module—Cable Routing

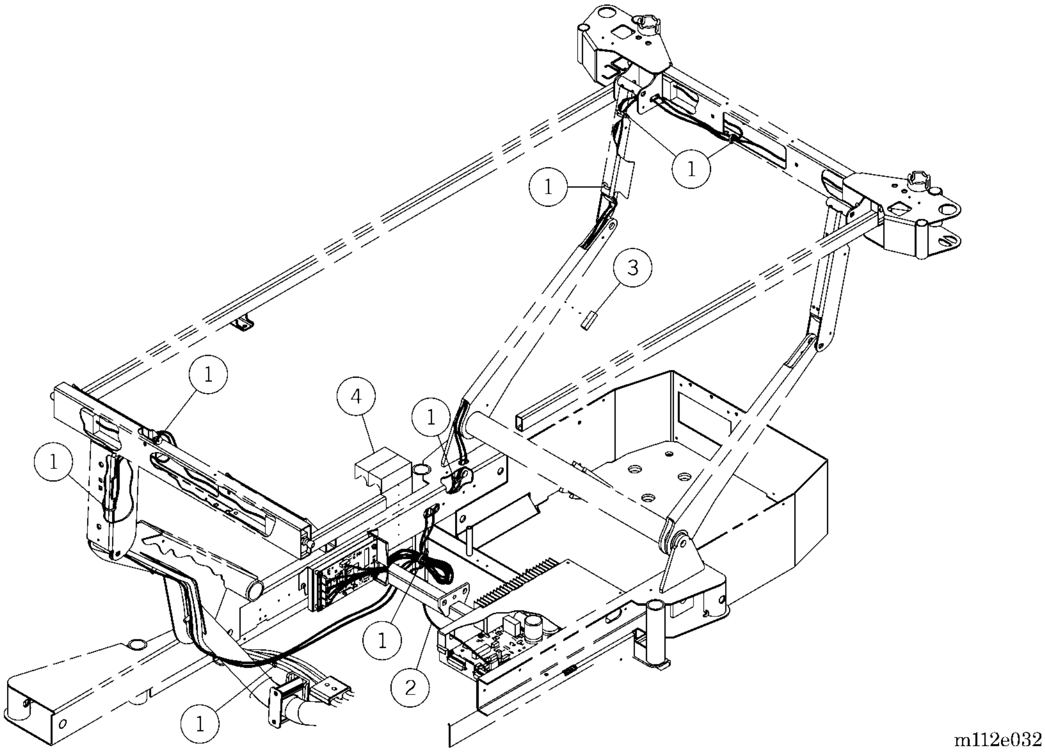

Table 5-29. Scale Module—Cable Routing

Item Number	Part Number	Quantity	Description
1	19124 (1900)	8	Large cable tie
2	4706201 (1900)	1	Cable assembly, scale/patient exit detection
3	4088901 (1900)	1	Sponge
4	67528 (1900)	1	Electromagnetic interference (EMI) suppressor (OIML scale beds only)

NOTES:

SideCom® Communication System

Figure 5-30. SideCom® Communication System

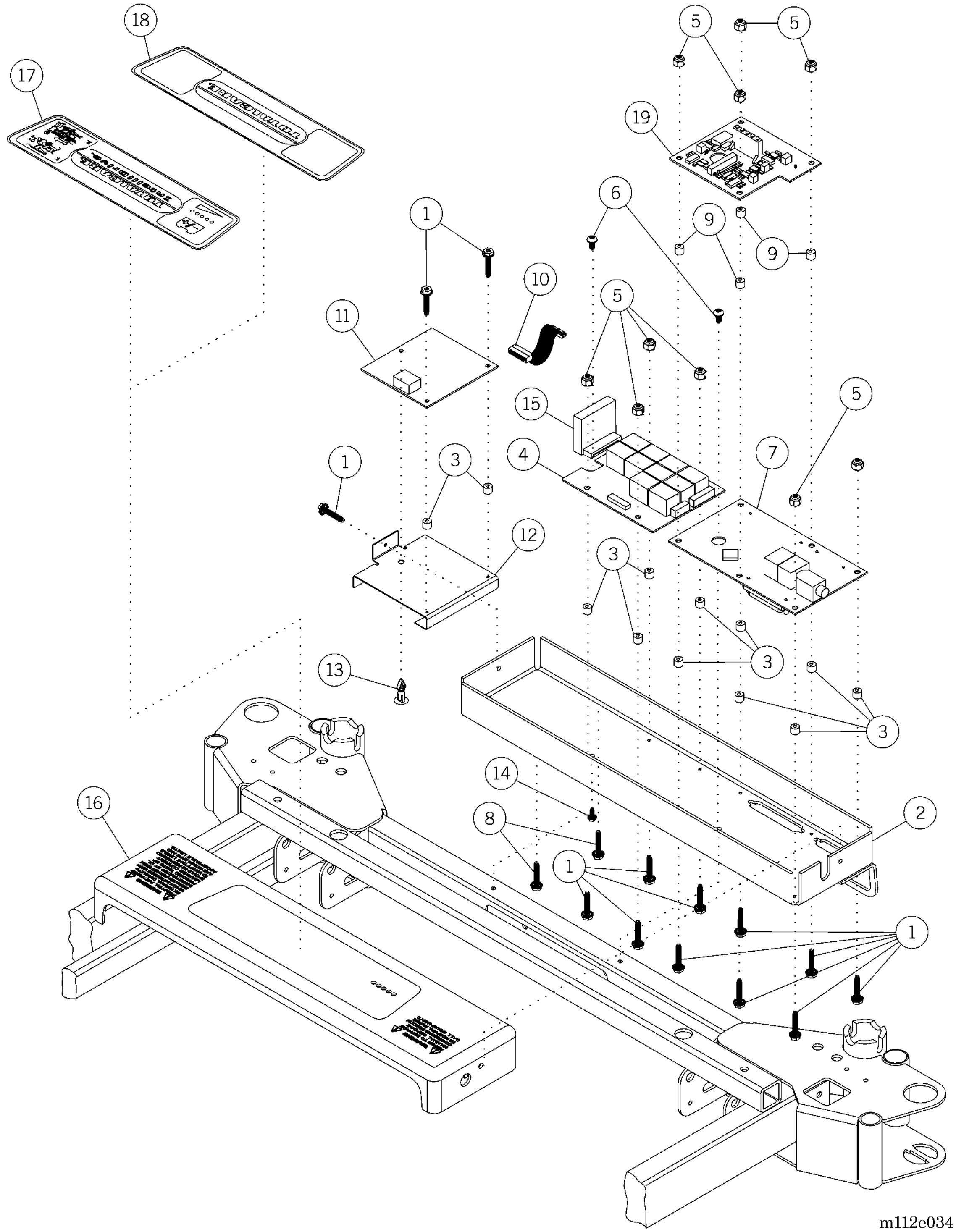
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Table 5-30. SideCom® Communication System

Item Number	Part Number	Quantity	Description
1	49508 (1900)	4 to 13	Screw, formed, hexwasher
2	49497pl (1900)	1	Weldment, SideCom® Communication System enclosure
3	49463 (1900)	4 to 12	Spacer, plastic
4	4843601 (1900)	1	P.C. board assembly, SideCom® Communication System—entertainment/ lighting (standard patient lighting/ entertainment model only)
	484602 (1900)		P.C. board assembly, SideCom® Communication System—entertainment/ lighting (enhanced entertainment)
	6317902 (1900)		P.C. board assembly, SideCom® Communication System—entertainment/ lighting (UTV board, used with enhanced entertainment)
	4843602 (1900)	1	P.C. board assembly, SideCom® Communication System—entertainment/ lighting (standard patient lighting/ entertainment and universal television models only)
5	11247 (1900)	4 to 10	Nut
6	43878 (1900)	2	Torx®[a] button head screw
7	6407901 (1900)	1	P.C. board assembly, SideCom® Communication System—nurse call, standard (nurse call/patient exit detection model only)
8	47161 (1900)	2	#6-32 x 5/8" type F six-lobe screw (universal television model only)
9	6874501 (1900)	4	Spacer (IntelliDrive® Transport System beds only)
10	63495 (1900)	1	Ribbon cable (universal television model only)
11	6317902 (1900)	1	Universal television control board assembly (universal television model only)
12	64172 (1900)	1	Bracket, universal television (universal television model only)

Item Number	Part Number	Quantity	Description
13	3976301 (1900)	1	Standoff (universal television model only)
14	40601 (1900)	1	Screw (nurse call/patient exit detection model only)
15	4476701 (1900)	1	Television module standard (enhanced patient lighting/entertainment model only)
16	68521 (1900)	1	Cover, SideCom® Communication System
17	6836501S (1900)	1	Battery charge label (IntelliDrive® Transport System beds only)
18	6836502 (1900)	1	Label, head end, battery charge
19	68276 (1900)	1	PAG board (IntelliDrive® Transport System beds only)

a. Torx® is a registered trademark of Textron, Inc.

NOTES:

SideCom® Communication System—Cable Routing

Figure 5-31. SideCom® Communication System—Cable Routing

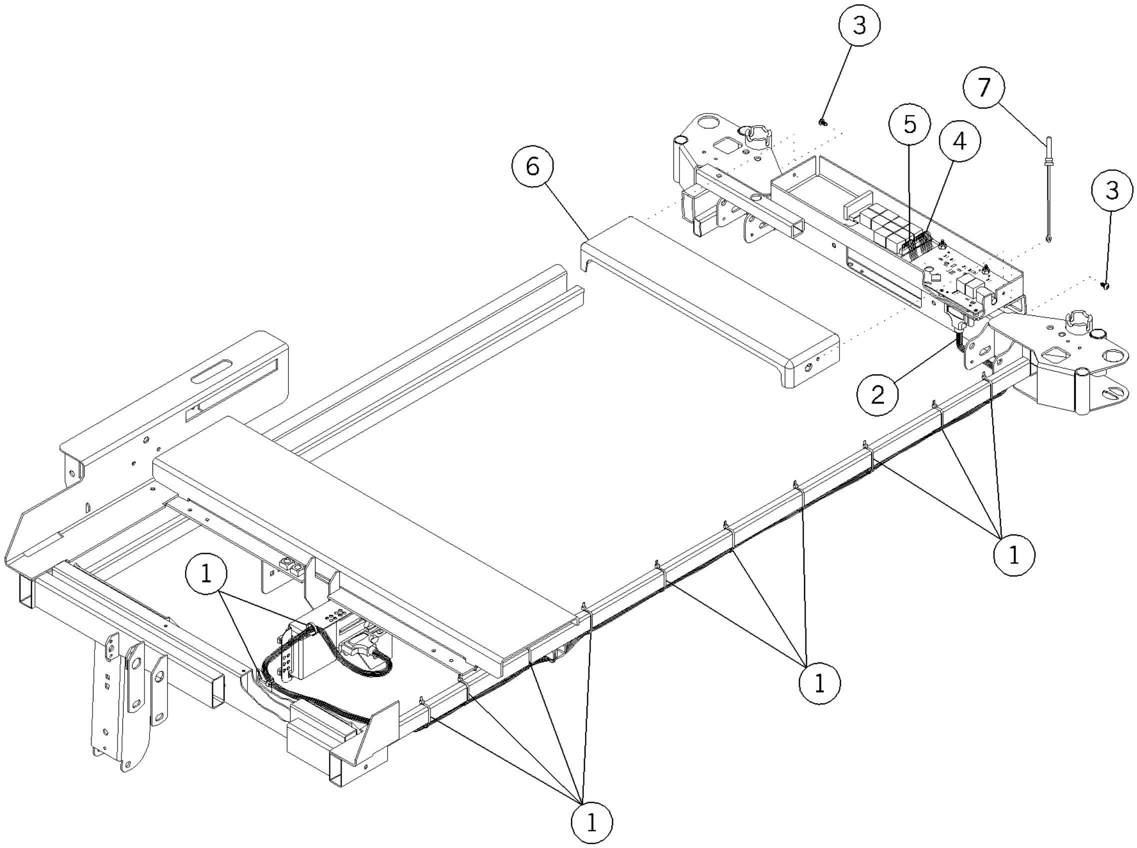

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Table 5-31. SideCom® Communication System—Cable Routing

Item Number	Part Number	Quantity	Description
1	19124 (1900)	12	Large cable tie
2	4853701 (1900)	1	Cable assembly, weigh frame—SideCom® Communication System
3	49493pl (1900)	2	Screw, formed, pan
4	3064601 (1900)	1	Cable assembly, SideCom® Communication System—entertainment (standard patient lighting/ entertainment, enhanced patient lighting/ entertainment, and universal television models only)
5	3064501 (1900)	1	Cable assembly, SideCom® Communication System—entertainment (standard patient lighting/ entertainment, enhanced patient lighting/ entertainment, and universal television models only)
6	47308 (1900)	1	Cover, SideCom® Communication System
7	34512 (1900)	1	Dummy plug

Air Module—Manifold Assembly

Figure 5-32. Air Module—Manifold Assembly

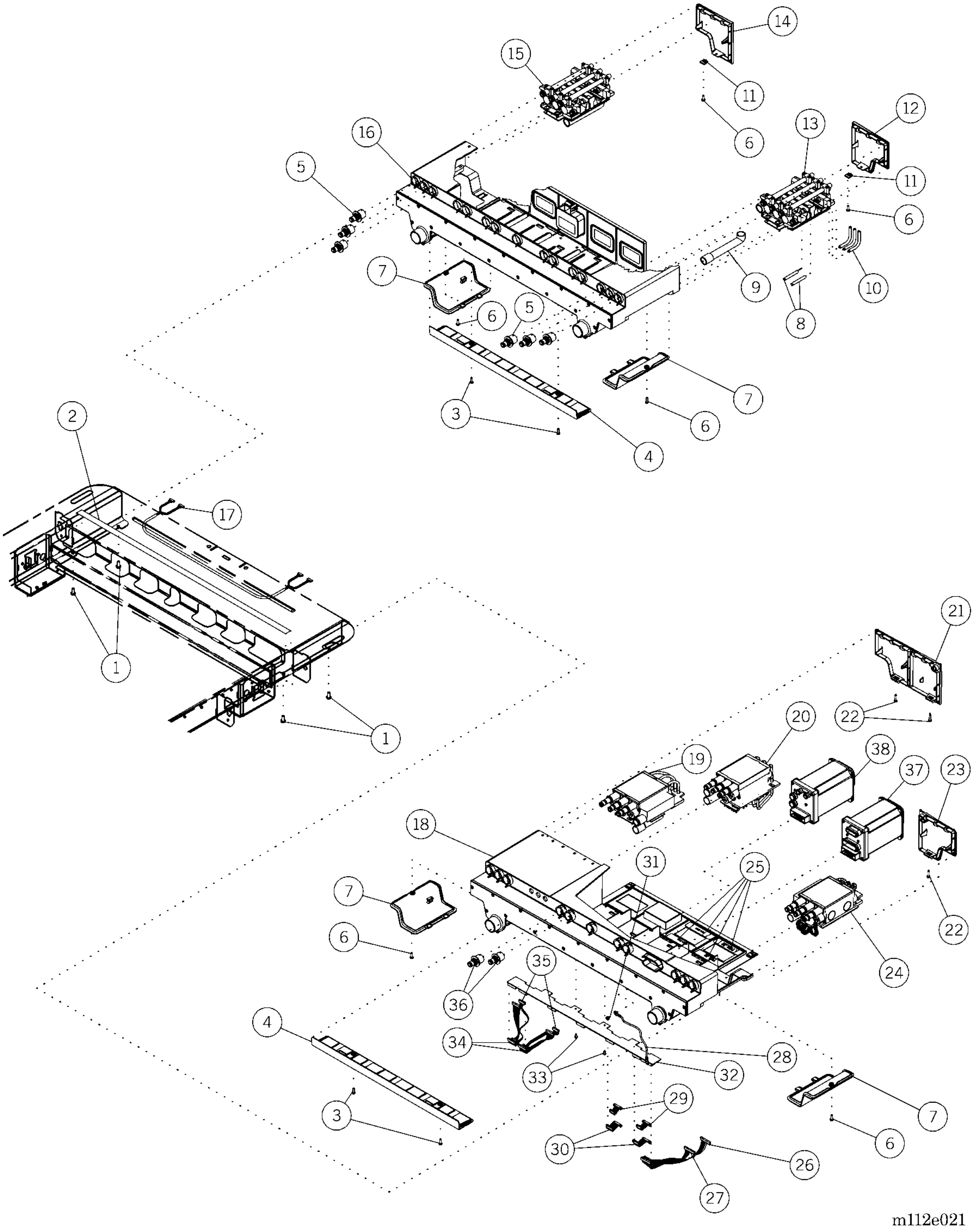
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Table 5-32. Air Module—Manifold Assembly

Item Number	Part Number	Quantity	Description
1	49435 (1900)	4	Screw, external tooth sems
2	61068 (1900)	1	Bladder connection position label
3	4914102 (1900)	2	Screw, sems
4	49417 (1900)	1	Cover connector, manifold
5	64531 (1900)	3	Bladder connector, permanent module
6	62567 (1900)	4	Nylon screw #6-32 x ½"
7	49418 (1900)	2	Access door, permanent module, manifold
8	6144202 (1900)	2	Sensor tube
9	4943202 (1900)	1 or 2	Molded tube, red
10	63044 (1900)	3 or 6	Sensor tube—formed
11	61133 (1900)	2	Nut, U-type
12	494190148 (1900)	1	Treatment foot surface module cover
13	63392S (1900)	1	Treatment foot surface control module
14	494190248 (1900)	1	Treatment surface module cover
15	63393S (1900)	1	Treatment surface control module (treatment surface control module model only)
16	62775 (1900)	1	Manifold assembly
17	3054801 (1900)	1	Cable assembly, treatment foot surface control module to treatment surface control module (treatment surface control module model only)
18	66928 (1900)	1	Air manifold assembly (P1900D only)
19	66729 (1900)	1	Treatment torso module assembly (P1900D only)
20	66726 (1900)	1	Pulmonary base module assembly (P1900D only)
21	66926 (1900)	1	Air manifold cover assembly, rh (P1900D only)
22	67237 (1900)	3	Screw machine, #6-31 x 5/8" (P1900D only)

Item Number	Part Number	Quantity	Description
23	66925 (1900)	1	Air manifold cover assembly, lh (P1900D only)
24	66728 (1900)	1	Treatment foot module assembly (P1900D only)
25	66977 (1900)	4	Air manifold door labels (P1900D only)
26	66547 (1900)	1	TFM to backplane 15 pin cable (P1900D only)
27	66541 (1900)	1	TFM to backplane 14 pin cable (P1900D only)
28	3924008 (1900)	1	Ground strap assembly (P1900D only)
29	66917 (1900)	2	Drawer to backplane 8 pin cable (P1900D only)
30	66546 (1900)	2	Drawer to backplane 11 pin cable (P1900D only)
31	67214 (1900)	1	Screw, form, hex washer, #6-32 x ¼" (P1900D only)
32	48448 (1900)	1	Air manifold backplane circuit board assembly (P1900D only)
33	6695404 (1900)	2	Screw (P1900D only)
34	66544 (1900)	2	Backplane to PBM/TTM cable (P1900D only)
35	66916 (1900)	2	TTM, base-RS232-to backplane cable (P1900D only)
36	64531 (1900)	2	Bladder connector, permanent module (P1900D only)
37	P1939B100 (1900)	1	Capital percussion and vibration module (English) (P1900D model only)
	P1939B200 (1900)	1	Capital percussion and vibration module (German) (P1900D model only)
	P1939B300 (1900)	1	Capital percussion and vibration module (French) (P1900D model only)
	P1939B400 (1900)	1	Capital percussion and vibration module (Spanish) (P1900D model only)
	P1939B500 (1900)	1	Capital percussion and vibration module (Portuguese) (P1900D model only)

Item Number	Part Number	Quantity	Description
37 (continued)	P1939B600 (1900)	1	Capital percussion and vibration module (Italian) (P1900D model only)
	P1939B700 (1900)	1	Capital percussion and vibration module (Dutch) (P1900D model only)
	P1939B800 (1900)	1	Capital percussion and vibration module (Swedish) (P1900D model only)
	P1939B900 (1900)	1	Capital percussion and vibration module (Arabic) (P1900D model only)
	P1939B1000 (1900)	1	Capital percussion and vibration module (Chinese—Traditional) (P1900D model only)
	P1939B1100 (1900)	1	Capital percussion and vibration module (Chinese—Simplified) (P1900D model only)
	P1939B1200 (1900)	1	Capital percussion and vibration module (Japanese) (P1900D model only)
	P1939B1300 (1900)	1	Capital percussion and vibration module (Greek) (P1900D model only)
	P1939B101 (1900)	1	Rental percussion and vibration module (English) (P1900D model only)
	P1939B201 (1900)	1	Rental percussion and vibration module (German) (P1900D model only)
	P1939B301 (1900)	1	Rental percussion and vibration module (French) (P1900D model only)
	P1939B401 (1900)	1	Rental percussion and vibration module (Spanish) (P1900D model only)
	P1939B501 (1900)	1	Rental percussion and vibration module (Portuguese) (P1900D model only)
	P1939B601 (1900)	1	Rental percussion and vibration module (Italian) (P1900D model only)
	P1939B701 (1900)	1	Rental percussion and vibration module (Dutch) (P1900D model only)
	P1939B801 (1900)	1	Rental percussion and vibration module (Swedish) (P1900D model only)
	P1939B901 (1900)	1	Rental percussion and vibration module (Arabic) (P1900D model only)

Item Number	Part Number	Quantity	Description
37 (continued)	P1939B1001 (1900)	1	Rental percussion and vibration module (Chinese—Traditional) (P1900D model only)
	P1939B1101 (1900)	1	Rental percussion and vibration module (Chinese—Simplified) (P1900D model only)
	P1939B1201 (1900)	1	Rental percussion and vibration module (Japanese) (P1900D model only)
	P1939B1301 (1900)	1	Rental percussion and vibration module (Greek) (P1900D model only)
	P1939B102 (1900)	1	Removable rental percussion and vibration module (English) (P1900D model only)
38	P1938B100 (1900)	1	Capital rotation module (English) (P1900D model only)
	P1938B200 (1900)	1	Capital rotation module (German) (P1900D model only)
	P1938B300 (1900)	1	Capital rotation module (French) (P1900D model only)
	P1938B400 (1900)	1	Capital rotation module (Spanish) (P1900D model only)
	P1938B500 (1900)	1	Capital rotation module (Portuguese) (P1900D model only)
	P1938B600 (1900)	1	Capital rotation module (Italian) (P1900D model only)
	P1938B700 (1900)	1	Capital rotation module (Dutch) (P1900D model only)
	P1938B800 (1900)	1	Capital rotation module (Swedish) (P1900D model only)
	P1938B900 (1900)	1	Capital rotation module (Arabic) (P1900D model only)
	P1938B1000 (1900)	1	Capital rotation module (Chinese—Traditional) (P1900D model only)
	P1938B1100 (1900)	1	Capital rotation module (Chinese—Simplified) (P1900D model only)

Item Number	Part Number	Quantity	Description
38 (continued)	P1938B1200 (1900)	1	Capital rotation module (Japanese) (P1900D model only)
	P1938B1300 (1900)	1	Capital rotation module (Greek) (P1900D model only)
	P1938B101 (1900)	1	Rental rotation module (English) (P1900D model only)
	P1938B201 (1900)	1	Rental rotation module (German) (P1900D model only)
	P1938B301 (1900)	1	Rental rotation module (French) (P1900D model only)
	P1938B401 (1900)	1	Rental rotation module (Spanish) (P1900D model only)
	P1938B501 (1900)	1	Rental rotation module (Portuguese) (P1900D model only)
	P1938B601 (1900)	1	Rental rotation module (Italian) (P1900D model only)
	P1938B701 (1900)	1	Rental rotation module (Dutch) (P1900D model only)
	P1938B801 (1900)	1	Rental rotation module (Swedish) (P1900D model only)
	P1938B901 (1900)	1	Rental rotation module (Arabic) (P1900D model only)
	P1938B1001 (1900)	1	Rental rotation module (Chinese—Traditional) (P1900D model only)
	P1938B1101 (1900)	1	Rental rotation module (Chinese—Simplified) (P1900D model only)
	P1938B1201 (1900)	1	Rental rotation module (Japanese) (P1900D model only)
	P1938B1301 (1900)	1	Rental rotation module (Greek) (P1900D model only)
	P1938B102 (1900)	1	Removable rental rotation module (English) (P1900D model only)

Air Module—Low Noise Blower Assembly Kit

Figure 5-33. Air Module—Low Noise Blower Assembly Kit

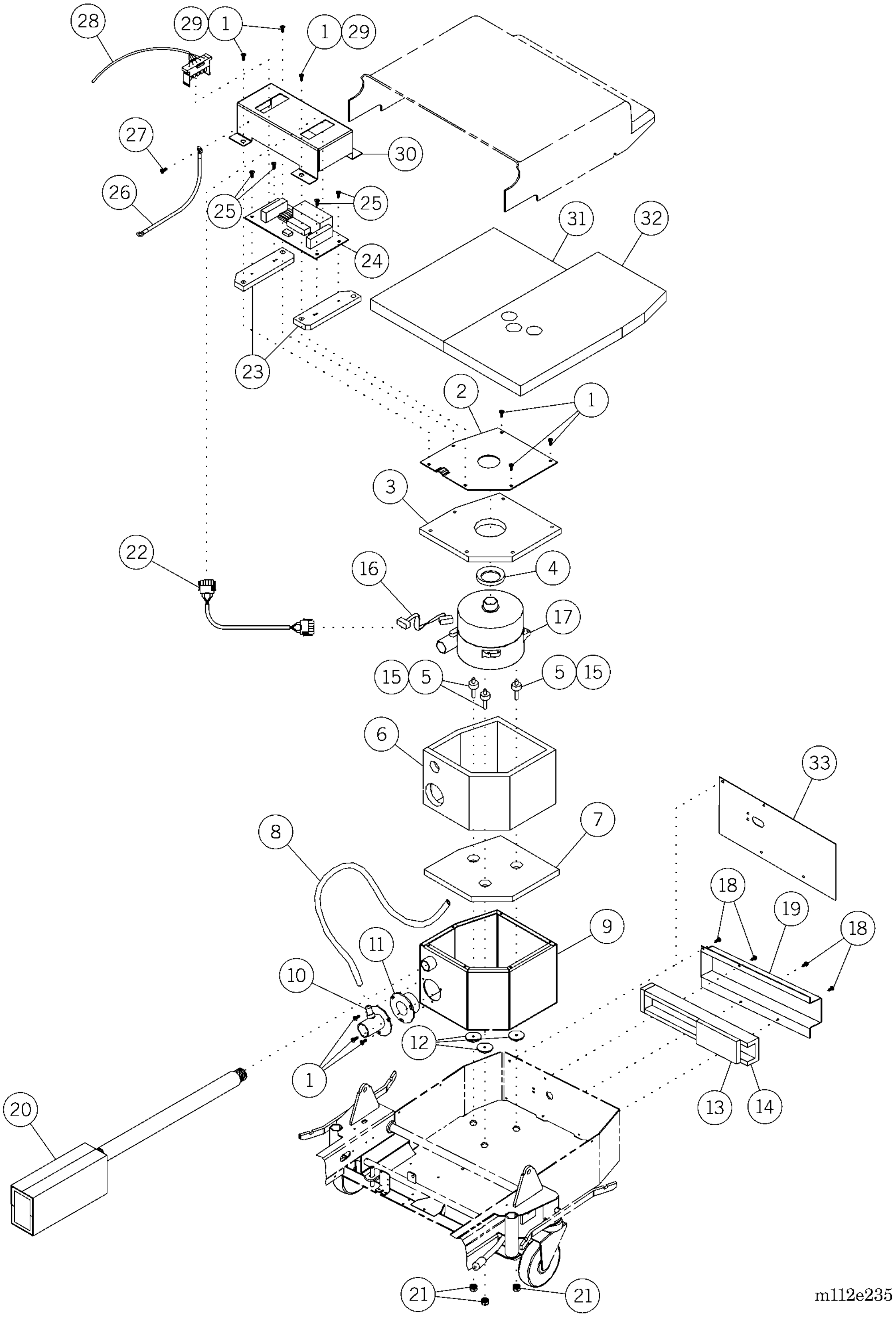
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Table 5-33. Air Module—Low Noise Blower Assembly

Item Number	Part Number	Quantity	Description
1	63166 (1900)	10 or 13	Lobe, special head type, #23 screw
2	6437448 (1900)	1	Cover, blower enclosure
3	64447 (1900)	1	Insulation, blower assembly top
4	64416 (1900)	1	Seal, blower assembly, vacuum port
5	64449 (1900)	3	Mount, ¼"-20 stud, isolation (“A” or “B” model only)
	6444901 (1900)	3	Mount, isolation (“C” or later model only)
6	64448 (19000	1	Insulation, blower assembly, side wall
7	64446 (1900)	1	Insulation, blower assembly, bottom
8	64572 (1900)	1	Hose, pressure vent
9	6446848 (1900)	1	Blower enclosure weldment assembly
10	64469 (1900)	1	Pressure port tube/flange assembly
11	64417 (1900)	1	Seal, blower assembly pressure port
12	64427 (1900)	6	Bushing, blower assembly, isolation (“A” or “B” model only)
	66433 (1900)	3	Washer/bushing, isolation (“C” or later model only)
13	64571 (1900)	1	Insulation, tub wall
14	64570 (1900)	1	Insulation, blower muffler
15	SA3618 (1900)	As required	Blue Loctite®[a] threadlocker, 10 cc bottle
16	6453001 (1900)	1	Cable assembly, treatment foot surface control module (TFSCM) blower motor
17	49309 (1900)	1	Blower, 120V, multi-stage
18	43878 (1900)	8	Torx®[b] button head screw (“D” model only)
19	6458248 (1900)	1	Weldment, muffler (“D” model only)
20	67228 (1900)	1	Intake/exhaust muffler assembly
21	20802 (1900)	3	Keps nut
22	71789 (1900)	1	Blower isolation adapter cable (110V/230V model only)

a. Loctite® is a registered trademark of Loctite Corporation.

b. Torx® is a registered trademark of Textron, Inc.

Item Number	Part Number	Quantity	Description
23	71724 (1900)	2	P.C. board bracket (110V/230V model only)
24	71700 (1900)	1	Blower isolation P.C. board (110V/230V model only)
25	4214101 (1900)	4	Screw, hilow (110V/230V model only)
26	3924013 (1900)	1	Ground strap assembly—17" (110V/230V model only)
27	49493 (1900)	1	Screw, formed, pan (110V/230V model only)
28	4853501 (1900)	1	Cable assembly, air source, 120V
	70939 (1900)	1	Cable assembly, air source, 110V/230V
	70940 (1900)	1	Cable assembly, air source, 127V/240V
	70938 (1900)	1	Cable assembly, air source, 110V/220V
29	43879 (1900)	3	Torx®[a] button head screw (110V/230V model only)
30	71726 (1900)	1	P.C. board bracket (110V/230V model only)
31	62024 (1900)	1	Insulation foam, rear base cover
32	62025 (1900)	1	Insulation foam, rear base cover
33	64660 (1900)	1	Plate, vent hose

[a] Torx® is a registered trademark of Textron, Inc.

NOTES:

Air Module—Supply Hose Assembly and Routing

Figure 5-34. Air Module—Supply Hose Assembly and Routing

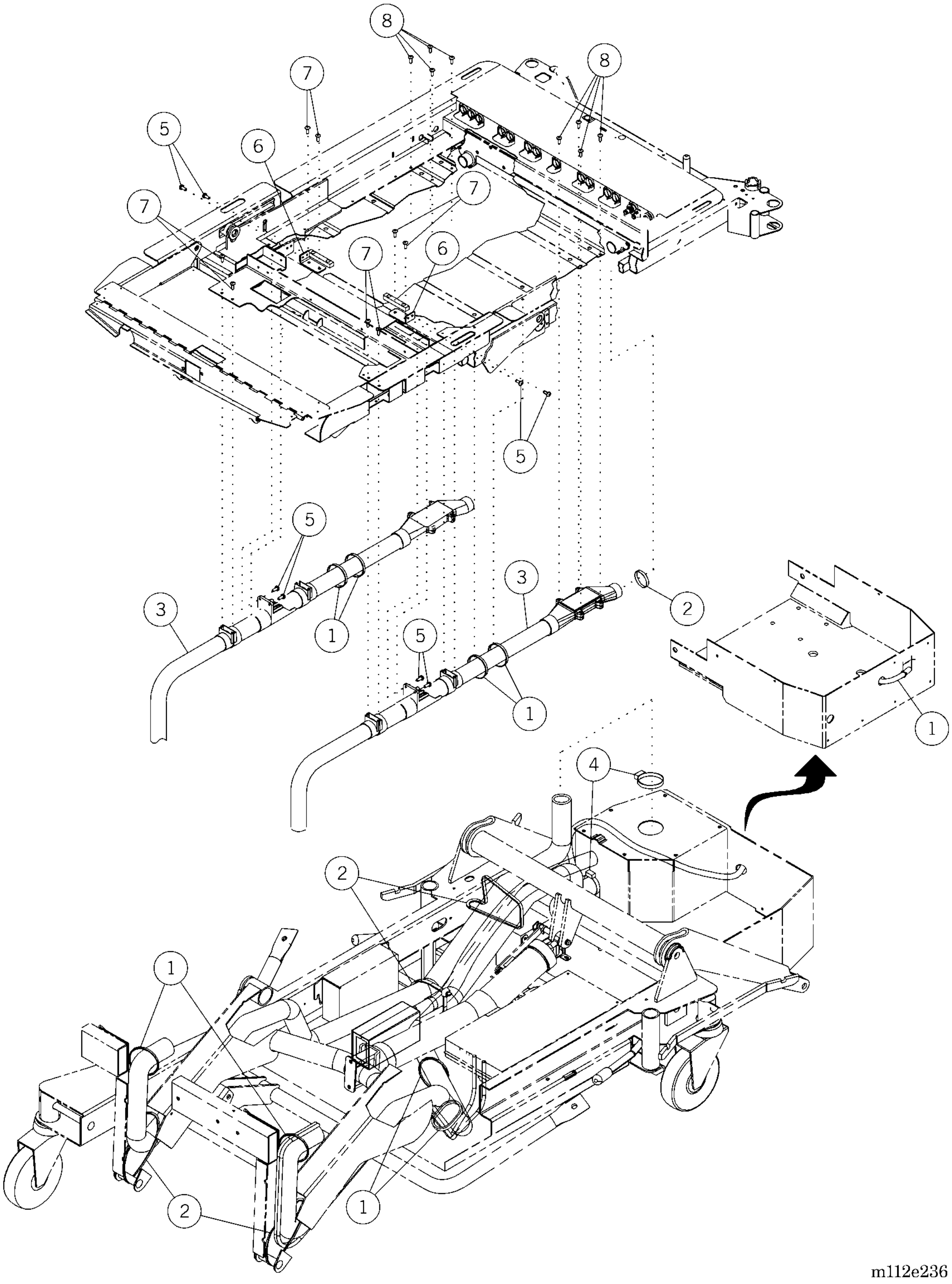
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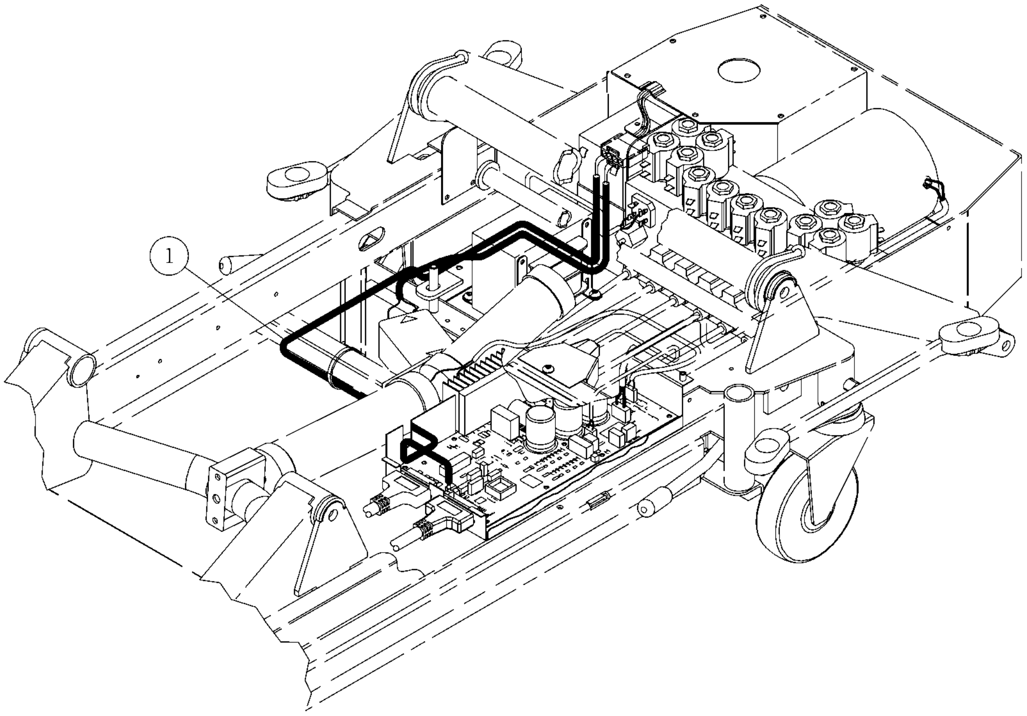
Table 5-34. Air Module—Supply Hose Assembly and Routing

Item Number	Part Number	Quantity	Description
1	19124 (1900)	8 or 10	Large cable tie
2	31844 (1900)	4 or 5	Cable tie
3	64606 (1900)	1 or 2	Assembly supply hose
4	64694 (1900)	2	Hose clamp
5	43878 (1900)	7 or 8	Torx®[a] button head screw
6	4943948 (1900)	2	Bracket
7	42142 (1900)	8	Pan head screw
8	4935201 (1900)	8	Screw, pan head (model without radiolucent deck only)
	4935202 (1900)	8	Screw, pan head (model with radiolucent deck only)

[a] Torx® is a registered trademark of Textron, Inc.

Air Module—Air Source Cable Assembly Routing—120V and 230V

Figure 5-35. Air Module—Air Source Cable Assembly Routing—120V and 230V



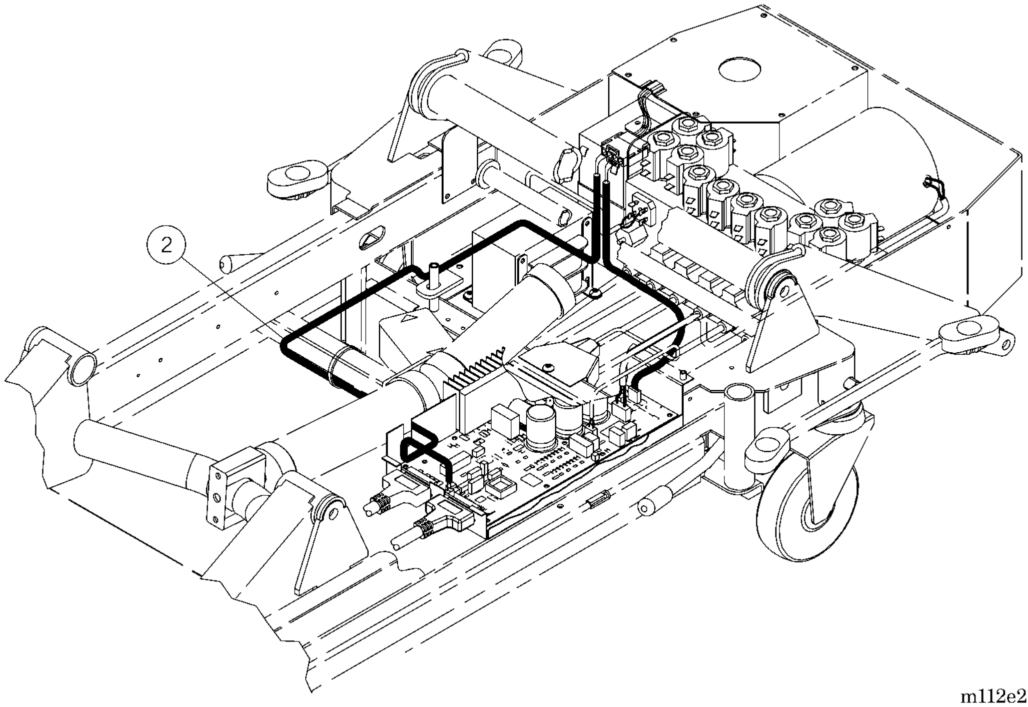


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Table 5-35. Air Module—Air Source Cable Assembly Routing—120V and 230V

Item Number	Part Number	Quantity	Description
1	4853501 (1900)	1	Cable assembly, air source (North American 120V model only)
2	6350901 (1900)	1	Cable assembly, air source (230V model only)

Air Module—Weigh Frame Cable Assembly Routing

Figure 5-36. Air Module—Weigh Frame Cable Assembly Routing

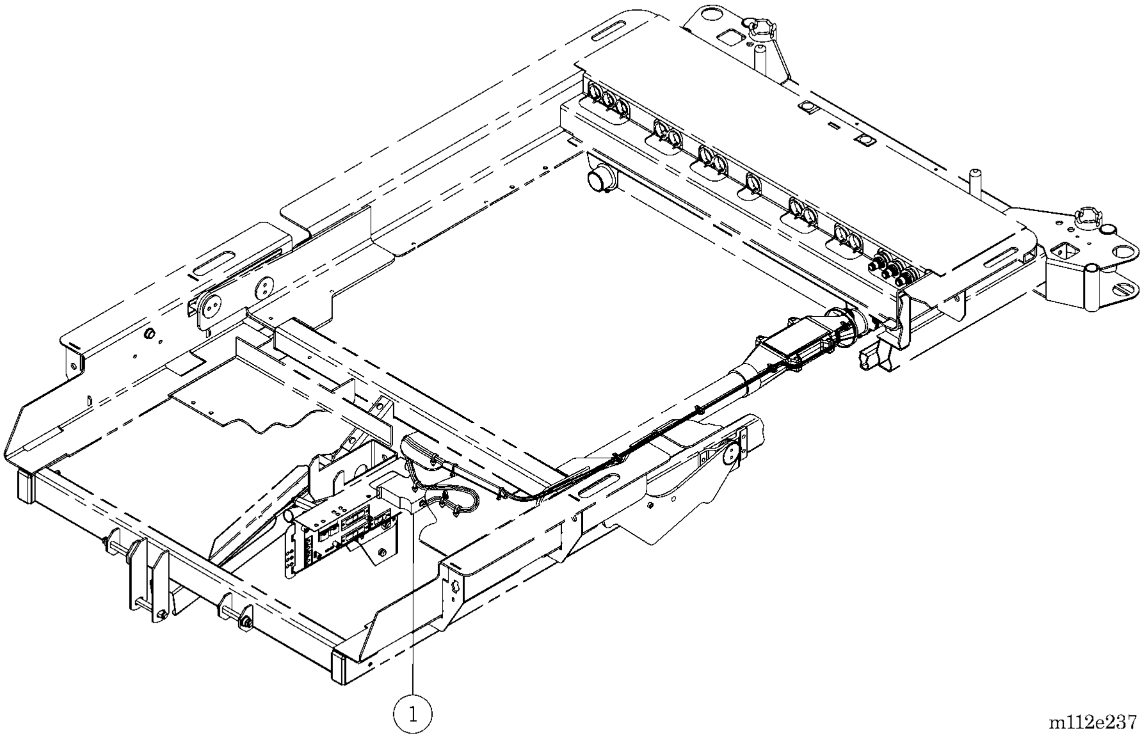

Table 5-36. Air Module—Weigh Frame Cable Assembly Routing

Item Number	Part Number	Quantity	Description
1	6305801 (1900)	1	Cable assembly, weigh frame (routes between P8 on the weigh frame junction P.C. board assembly and P1 and P12 on the TFSCM P.C. board assembly)

NOTES:

Short Stay Surface—P1915EC8

Figure 5-37. Short Stay Surface—P1915EC8

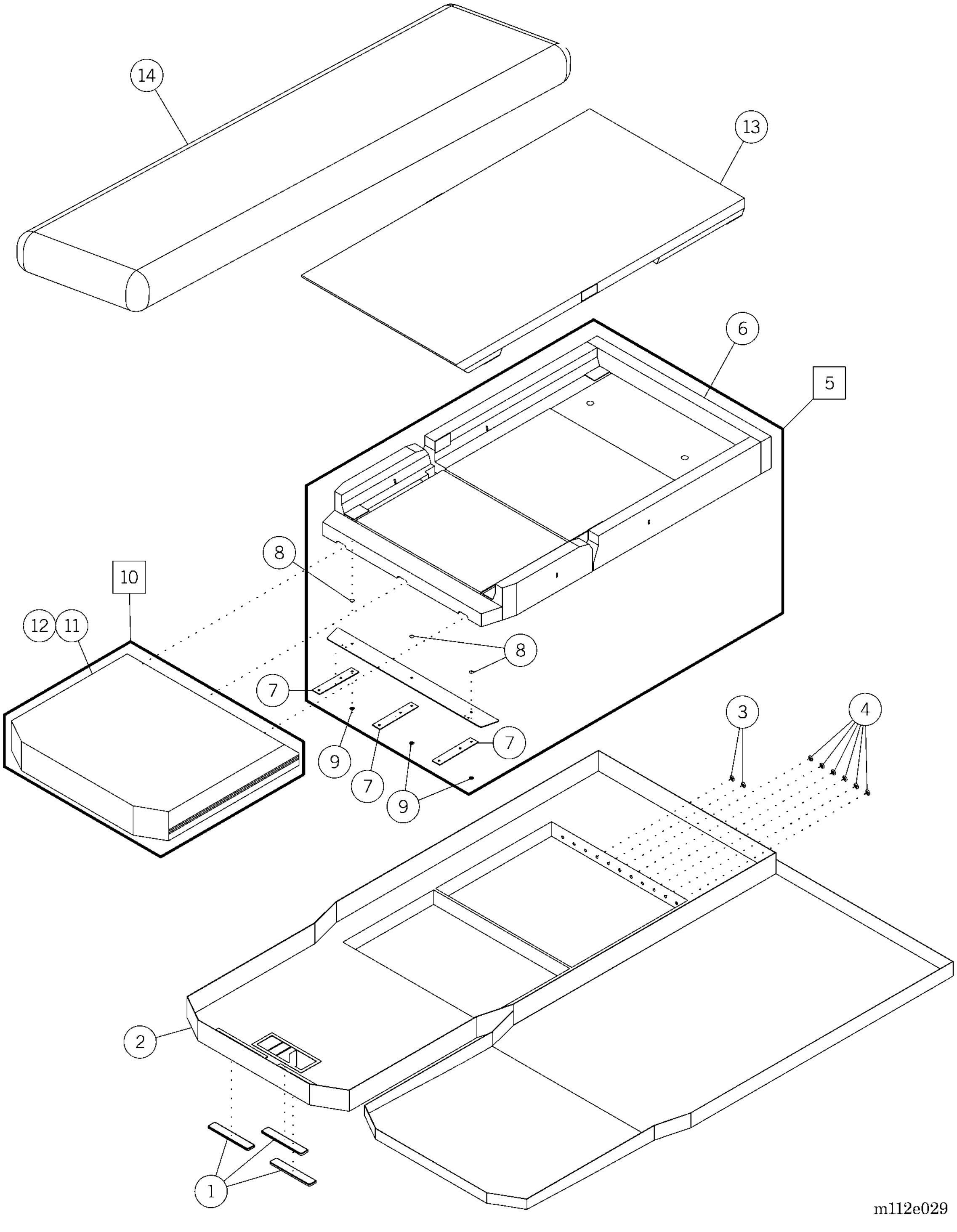
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Table 5-37. Short Stay Surface—P1915EC8

Item Number	Part Number	Quantity	Description
1	SA4589 (1900)	3	Magnet
2	66455 (1900)	1	Ticking assembly
	72518 (1900)	1	Ticking assembly (United Kingdom units only)
	72526 (1900)	1	Ticking assembly (Italian units only)
3	4933601 (1900)	5	Cap plug, ½"
4	4933602 (1900)	6	Cap plug, ¾"
5	65328 (1900)	1	Foundation foam
6	65330 (1900)	1	Head tray foam
7	49326 (1900)	3	Foot strap
8	6050601 (1900)	3	Snap rivet, female
9	6050602 (1900)	3	Snap rivet, male
10	4941401 (1900)	1	Foam foot module
11	49442 (1900)	1	Foam foot assembly
12	49370 (1900)	1	Foam foot slip sock
13	64888 (1900)	1	Continuous topper foam
14	71663 (1900)	1	Sheer liner, short stay

Treatment Surface—P1915EE9

Figure 5-38. Treatment Surface—P1915EE9

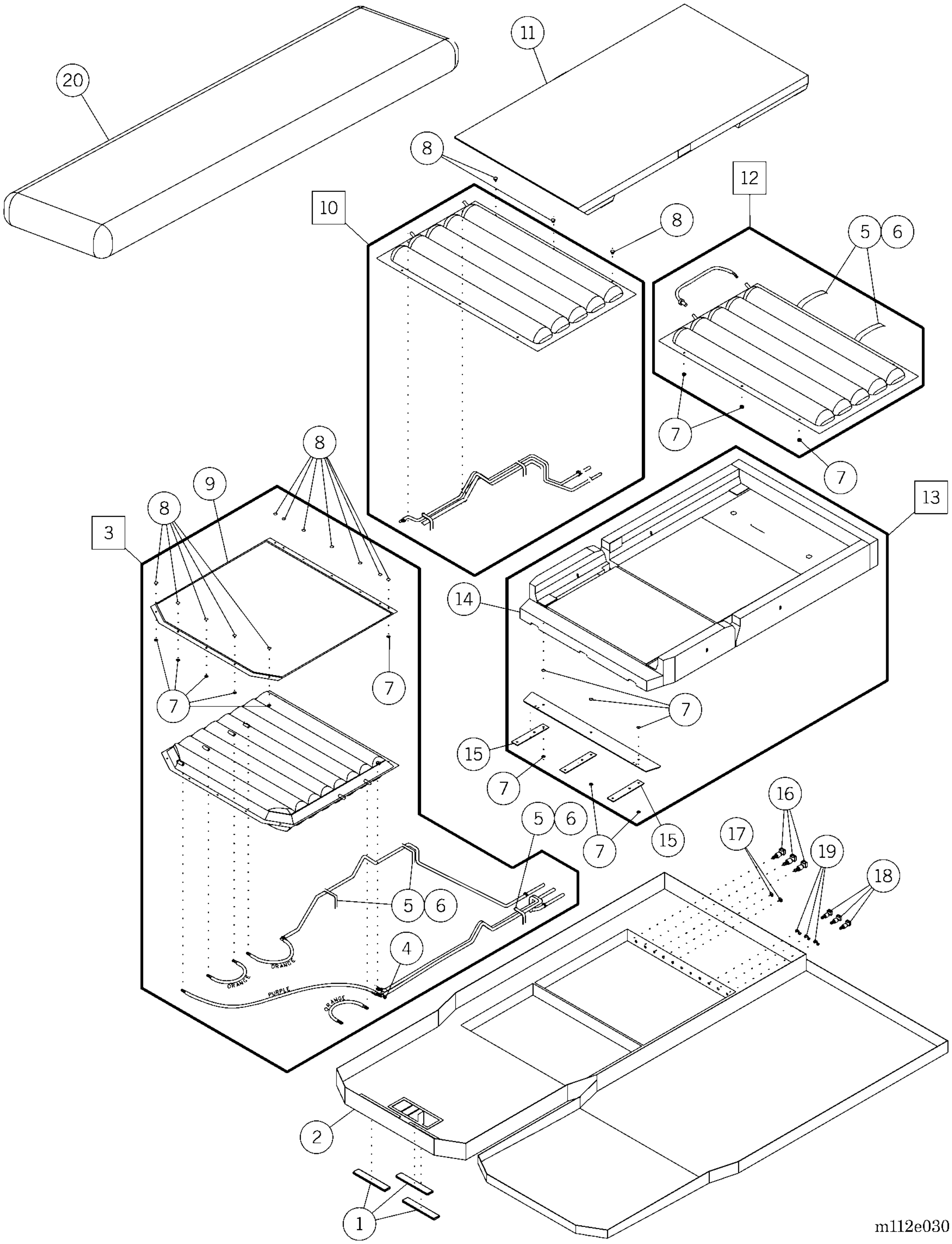
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Table 5-38. Treatment Surface—P1915EE9

Item Number	Part Number	Quantity	Description
1	SA4589 (1900)	3	Magnet
2	66455 (1900)	1	Ticking assembly
	72518 (1900)	1	Ticking assembly (United Kingdom units only)
	72526 (1900)	1	Ticking assembly (Italian units only)
3	49368 (1900)	1	Air foot module
4	19124 (1900)	2	Cable ties
5	4923802 (1900)	6	Velcro®[a] hook
6	4923803 (1900)	6	Velcro® loop
7	6050601 (1900)	21	Snap rivet, female
8	6050602 (1900)	21	Snap rivet, male
9	49369 (1900)	1	Slip sheet
10	64544 (1900)	1	Thigh air bladder assembly
11	64888 (1900)	1	Continuous topper foam
12	64543 (1900)	1	Torso air bladder assembly
13	65327 (1900)	1	Foundation foam
14	65329 (1900)	1	Head tray foam assembly
15	49326 (1900)	3	Foot strap
16	4932901 (1900)	3	Quick disconnect, shroud body
17	4933601 (1900)	2	Cap plug, ½"
18	4932902 (1900)	3	Quick disconnect, 3/8"
19	19124 (1900)	3	Cable tie
20	70192 (1900)	1	Sheer liner, treatment

[a] Velcro® is a registered trademark of Velcro Industries

Seatbelt—P1926

Figure 5-39. Seatbelt—P1926

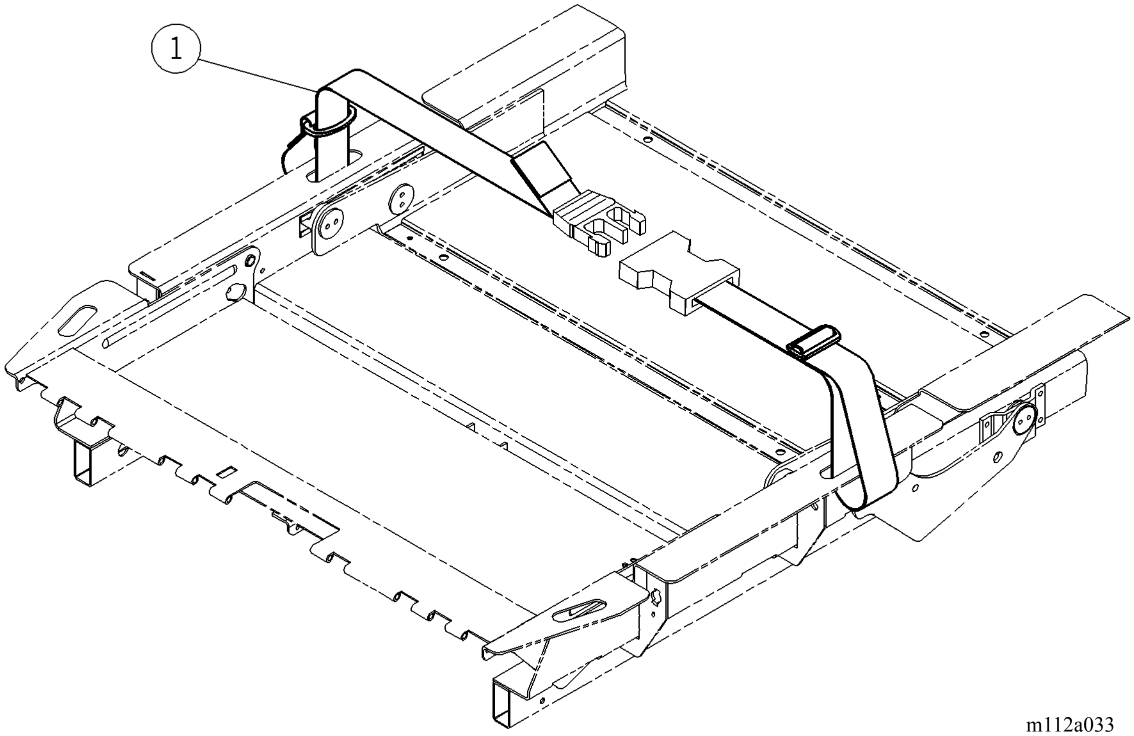

Table 5-39. Seatbelt—P1926

Item Number	Part Number	Quantity	Description
1	47302 (1900)	1	Seatbelt assembly

Foot Pad—P1929

Figure 5-40. Foot Pad—P1929

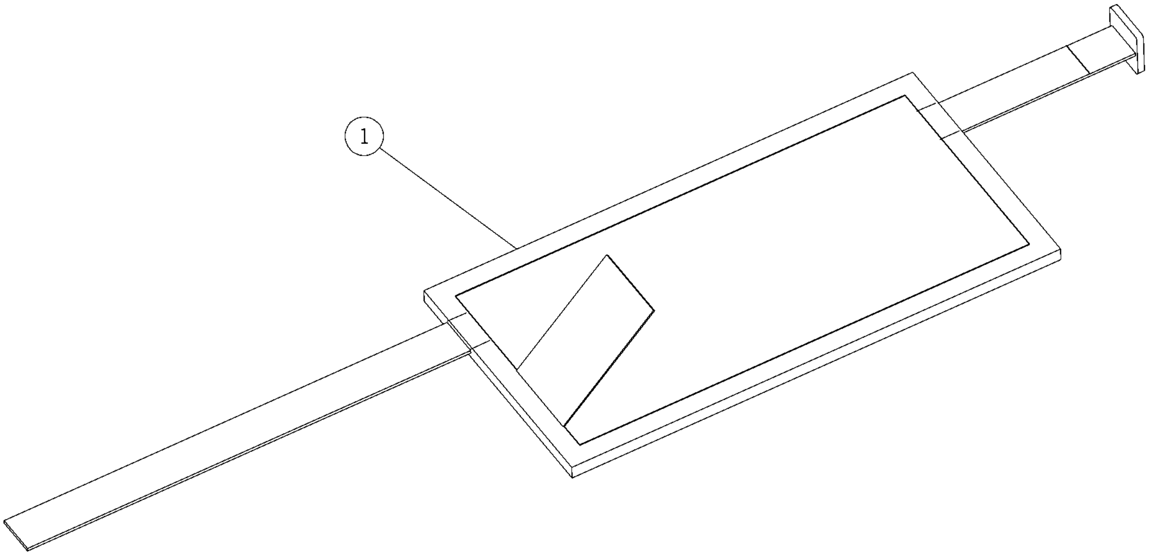

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Table 5-40. Foot Pad—P1929

Item Number	Part Number	Quantity	Description
1	P1929 (1900)	1	2" foot pad—TotalCare® Bed System

Transducer Holder—P294

Figure 5-41. Transducer Holder—P294

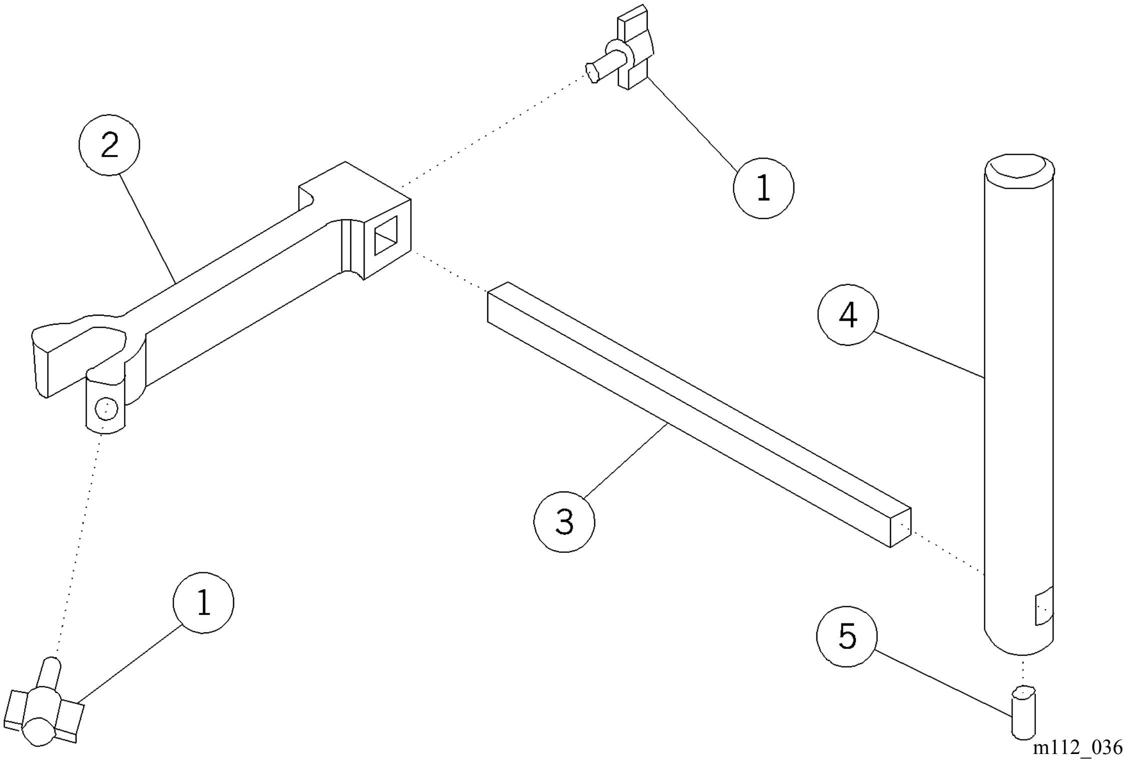

Table 5-41. Transducer Holder—P294

Item Number	Part Number	Quantity	Description
1	38135 (1900)	2	Knob assembly
2	38743 (1900)	1	Transducer mount extrusion
3	38742 (1900)	1	Extrusion rod—transducer mount
4	38744 (1900)	1	Height adjustment rod
5	90301-16 (1900)	1	Setscrew

Traction Bracket—P1940

Figure 5-42. Traction Bracket—P1940

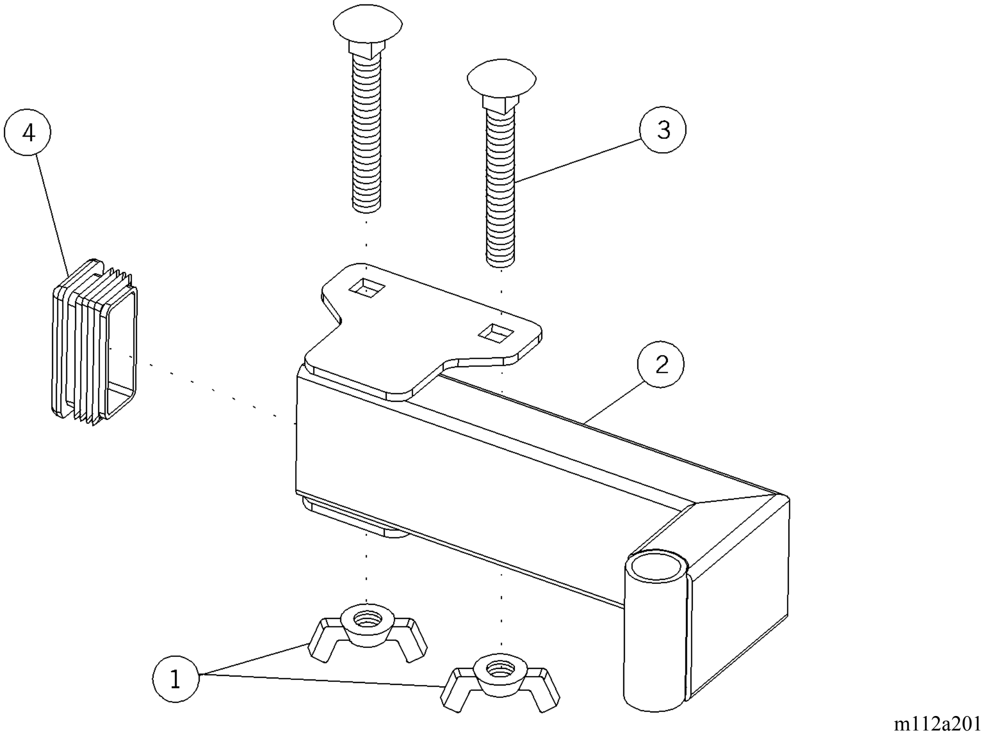

Table 5-42. Traction Bracket—P1940

Item Number	Part Number	Quantity	Description
1	63222 (1900)	2	Wing nut, 5/16"-18
2	62798 (1900)	1	Traction bracket assembly
3	63221 (1900)	2	5/16”-18 round head square neck bolt
4	4917702 (1900)	1	Plug, frame tube

NOTE:
For use with traction equipment from Texas Medical Industries, Inc.(TMI) or Orthopedic Systems, Inc. **only**.

X-Ray Cassette Envelope—P289

Figure 5-43. X-Ray Cassette Envelope—P289

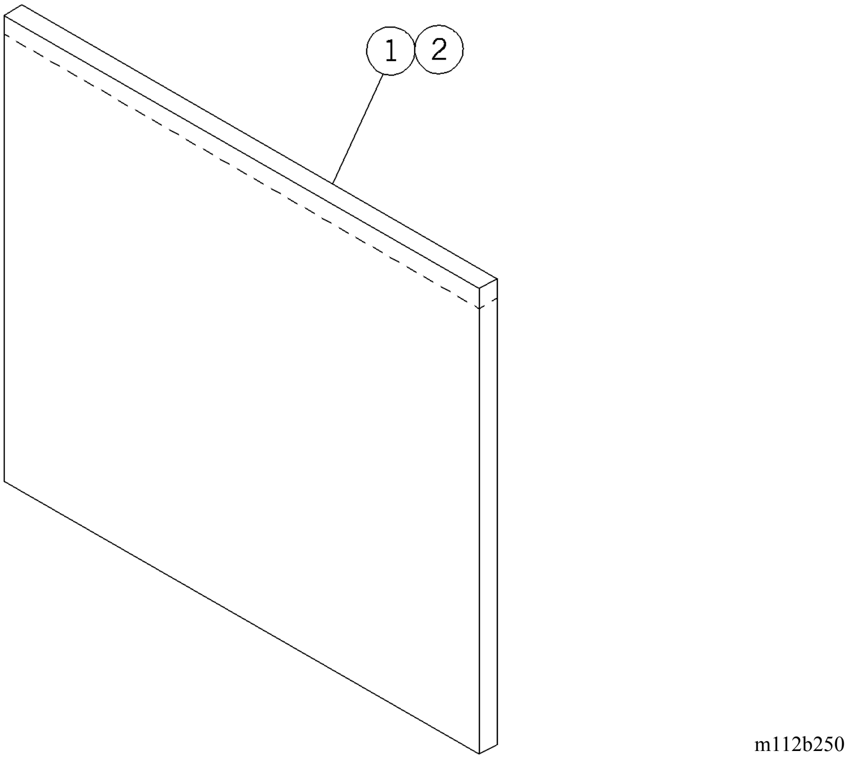

Table 5-43. X-Ray Cassette Envelope—P289

Item Number	Part Number	Quantity	Description
1	P289A (1900)	1	Sleeve/cover (small)
2	P289B (1900)	1	Sleeve/cover (large)

Oxygen Tank Holder—P27601

Figure 5-44. Oxygen Tank Holder—P27601

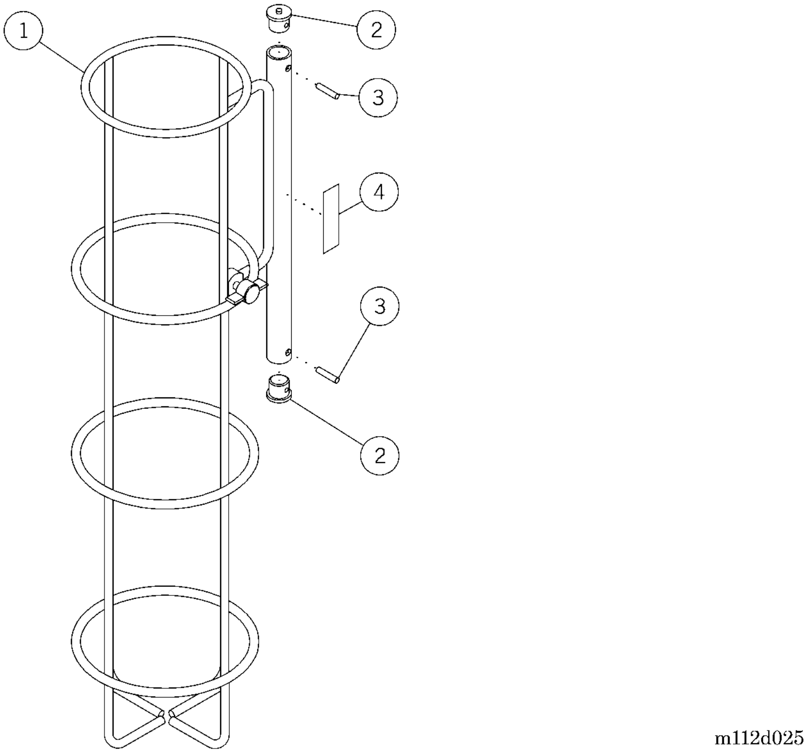

Table 5-44. Oxygen Tank Holder—P27601

Item Number	Part Number	Quantity	Description
1	42703 (1900)	1	Oxygen tank holder
2	3633901PL (1900)	2	Tube end
3	9685 (1900)	2	Roll pin
4	67873 (1900)	1	Label

IV Pole—P2217

Figure 5-45. IV Pole—P2217

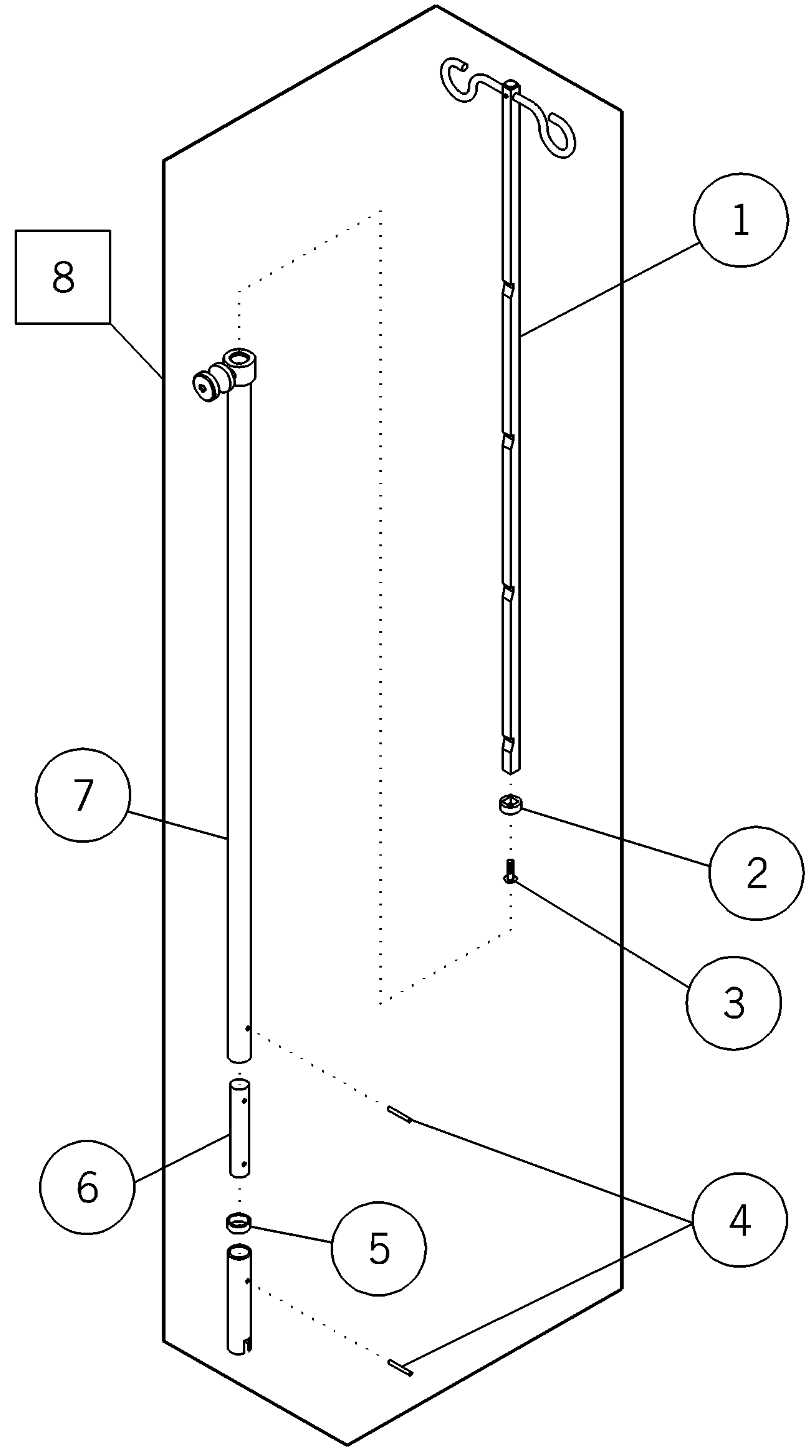

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Table 5-45. IV Pole—P2217

Item Number	Part Number	Quantity	Description
1	32534 (1900)	1	Extension rod assembly
2	32202 (1900)	1	Nylon guide
3	10866 (1900)	1	Screw
4	10640 (1900)	1	Roll pin
5	32201 (1900)	1	Extension
6	20858 (1900)	1	Coupling
7	32199 (1900)	1	Outer tube assembly
8	2217 (1900)	1	IV rod

Infusion Support System—P155-12

Figure 5-46. Infusion Support System—P155-05

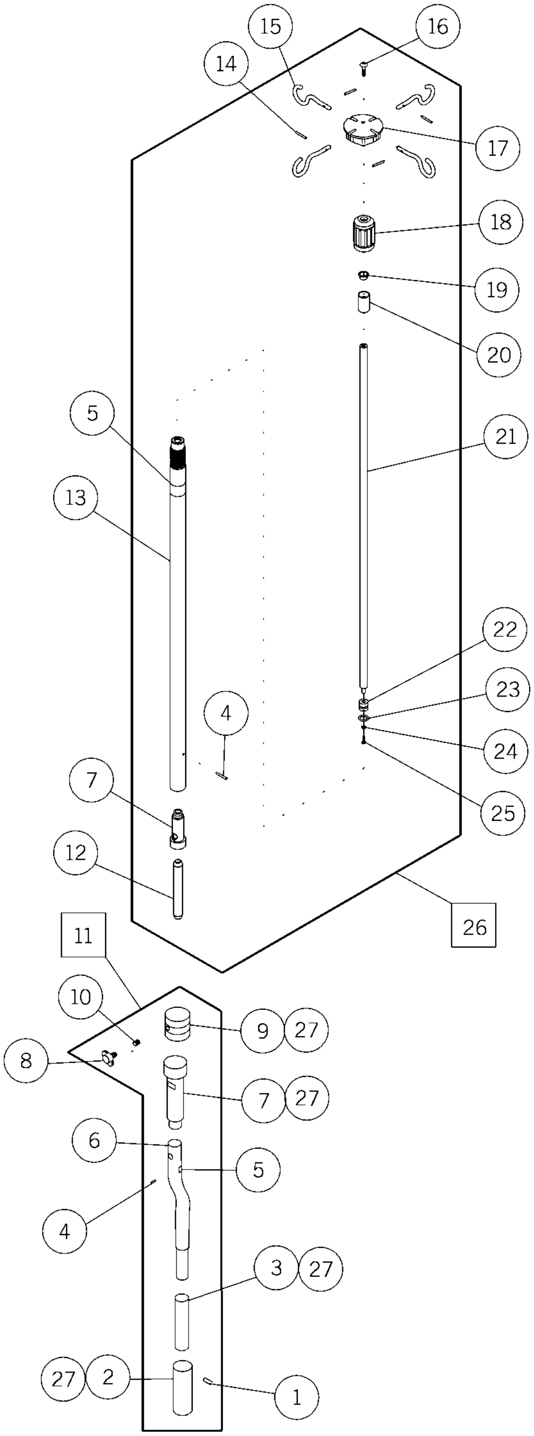
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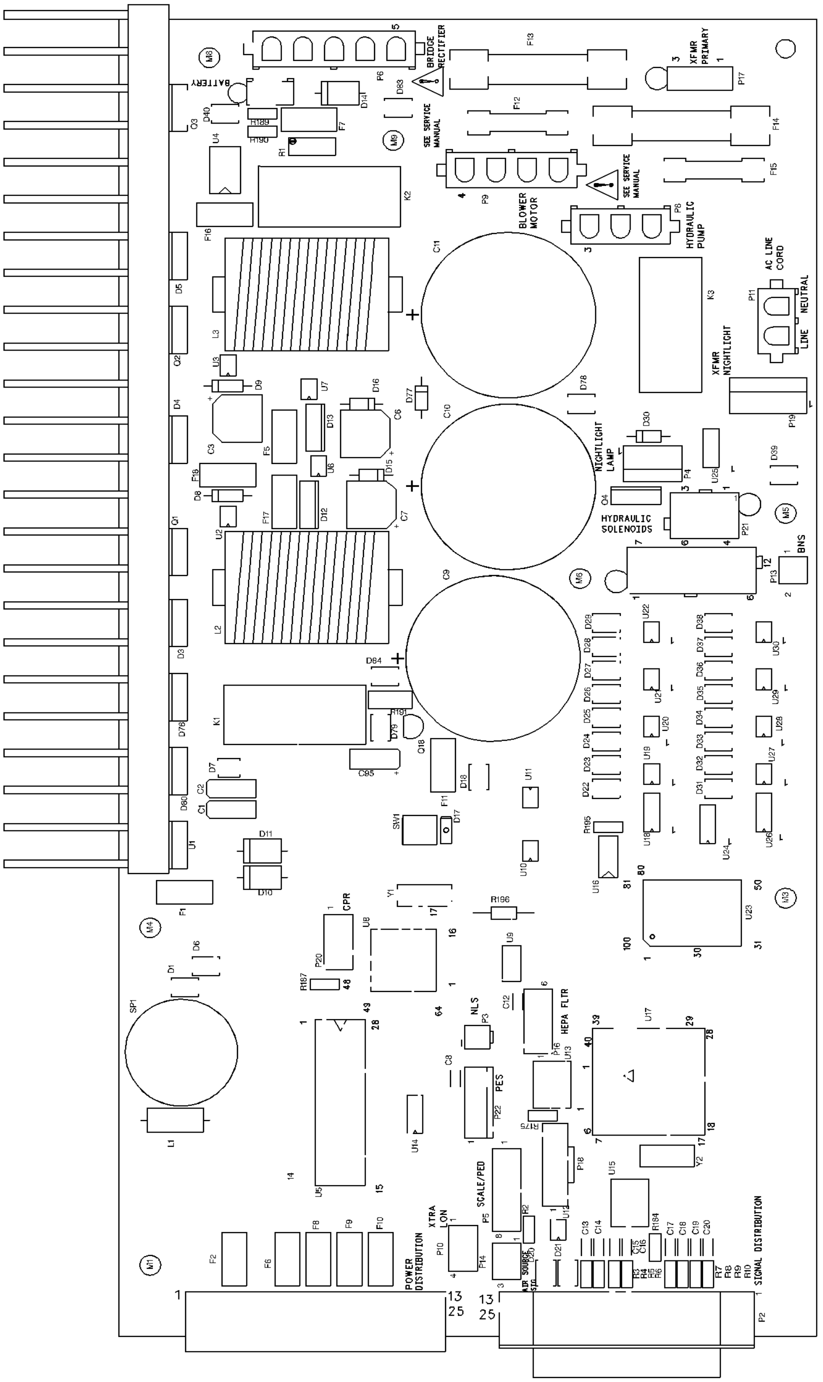
Table 5-46. Infusion Support System—P155-05

Item Number	Part Number	Quantity	Description
1	35373 (1900)	1	Roll pin
2	35025 (1900)	1	Outer insulator
3	35008 (1900)	1	Stiffener
4	35334 (1900)	2	Spring pin
5	35044 (1900)	2	Label
6	35024 (1900)	1	Oblique tube
7	35022 (1900)	2	Inner insulator
8	38135 (1900)	1	Knob assembly
9	35023 (1900)	2	Stanchion end
10	35012 (1900)	1	Thread insert
11	P159 (1900)	1	Offset bar
12	35005 (1900)	1	Locator
13	35021 (1900)	1	Transfer pole
14	35018 (1900)	4	Roll pin
15	35003 (1900)	4	IV hook
16	17290 (1900)	1	Mounting screw
17	35001 (1900)	1	Hub
18	35002 (1900)	1	Collet
19	35007 (1900)	1	Ferrule complete
20	35004 (1900)	1	Insert
21	35026 (1900)	1	Telescoping tube
22	35020 (1900)	1	End cap
23	35019 (1900)	1	O-ring
24	864 (1900)	1	Washer
25	17232 (1900)	1	Screw
26	P158 (1900)	1	Transfer pole
27	35015 (1900)	As required	Epoxy

P.C. Board Component Layout—Power Control P/N 4704101/02 Top

Figure 5-47. P.C. Board Component Layout—Power Control P/N 4704101/02 Top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BRIDGE RECTIFIER
SEE SERVICE MANUAL
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BLOWER MOTOR
HYDRAULIC PUMP
AC LINE CORD
NEUTRAL
LINE
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NIGHTLIGHT LAMP
HYDRAULIC SOLENOIDS
BNS
CPR
NLS
HEPA FLTR
PES
SCALE/PED
XTRA LON
AIR SOURCE
POWER DISTRIBUTION
SIGNAL DISTRIBUTION
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U5
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U17
U23
P2
P9
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Table 5-47. P.C. Board Component Layout—Power Control P/N 4704101/02 Top

Component Symbol	Part Number	Description
F1, F9	3049201 (1900)	Fuse, 1½A, 125V, with block
F2, F6, F8	3049206 (1900)	Fuse
F5, F7, F11	3049204 (1900)	Fuse
F10, F16	3049205 (1900)	Fuse
F13, F14	4840315 (1900)	Fuse
F12, F15	3055201 (1900)	Fuse holder, P.C. board, clip (230V model only)
F13, F14	4840201 (1900)	Fuse holder, P.C. board, clip (North American 120V model only)
F17, F18	3049203 (1900)	Fuse
All of the above	SA1689 (1900)	Fuse kit for power control module power control board

Pulmonary Surface, P1915EC5 (P1900D Model)

Figure 5-48. Pulmonary Surface, P1915EC5 (P1900D Model)

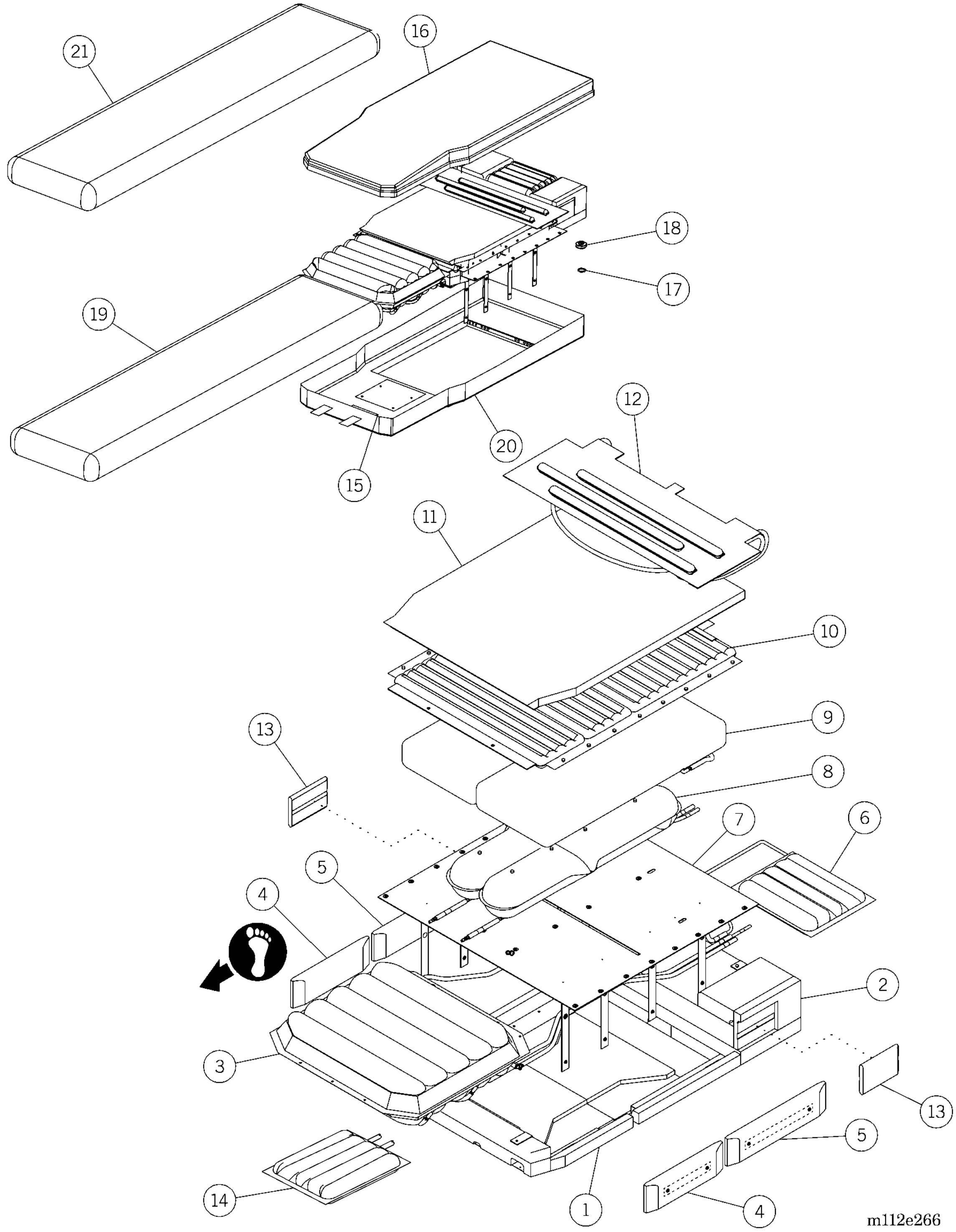
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Table 5-48. Pulmonary Surface, P1915EC5 (P1900D Model)

Item Number	Part Number	Quantity	Description
1	67001 (1900)	1	Thigh assembly
2	67000 (1900)	1	Head assembly
3	65999 (1900)	1	Foot cushion
4	66087 (1900)	2	Thigh bolster assembly
5	66086 (1900)	2	Head bolster assembly
6	66089 (1900)	1	Head cushion
7	66106 (1900)	1	Cushion mounting substrate
8	66066 (1900)	2	Boost cushion, torso
9	65997 (1900)	1	Working cushion
10	66085 (1900)	1	Treatment cushion
11	66080 (1900)	1	Topper foam
12	66287 (1900)	1	Percussion and Vibration cushion
13	66999 (1900)	2	Percussion and Vibration sleeve assembly
14	66088 (1900)	1	Foot boost section
15	49243 (1900)	3	Magnet
16	66938 (1900)	1	Top cover
	72523 (1900)	1	Top cover assembly (United Kingdom units only)
	72531 (1900)	1	Top cover assembly (Italian units only)
	72534 (1900)	1	Top cover assembly (French units only)
17	49357-03 (1900)	1	O-ring
18	49410 (1900)	1	Super snap disk
19	49327-04 (1900)	1	Fire barrier
20	66940 (1900)	1	Bottom cover
	72524 (1900)	1	Bottom cover assembly (United Kingdom units only)
	72532 (1900)	1	Bottom cover assembly (Italian units only)
	72535 (1900)	1	Bottom cover assembly (French units only)
21	70193 (1900)	1	Sheer liner, TotalCare SpO$_2$RT® Pulmonary Therapy System

Pulmonary Surface Plumbing (P1900D Model)

Figure 5-49. Pulmonary Surface Plumbing (P1900D Model)

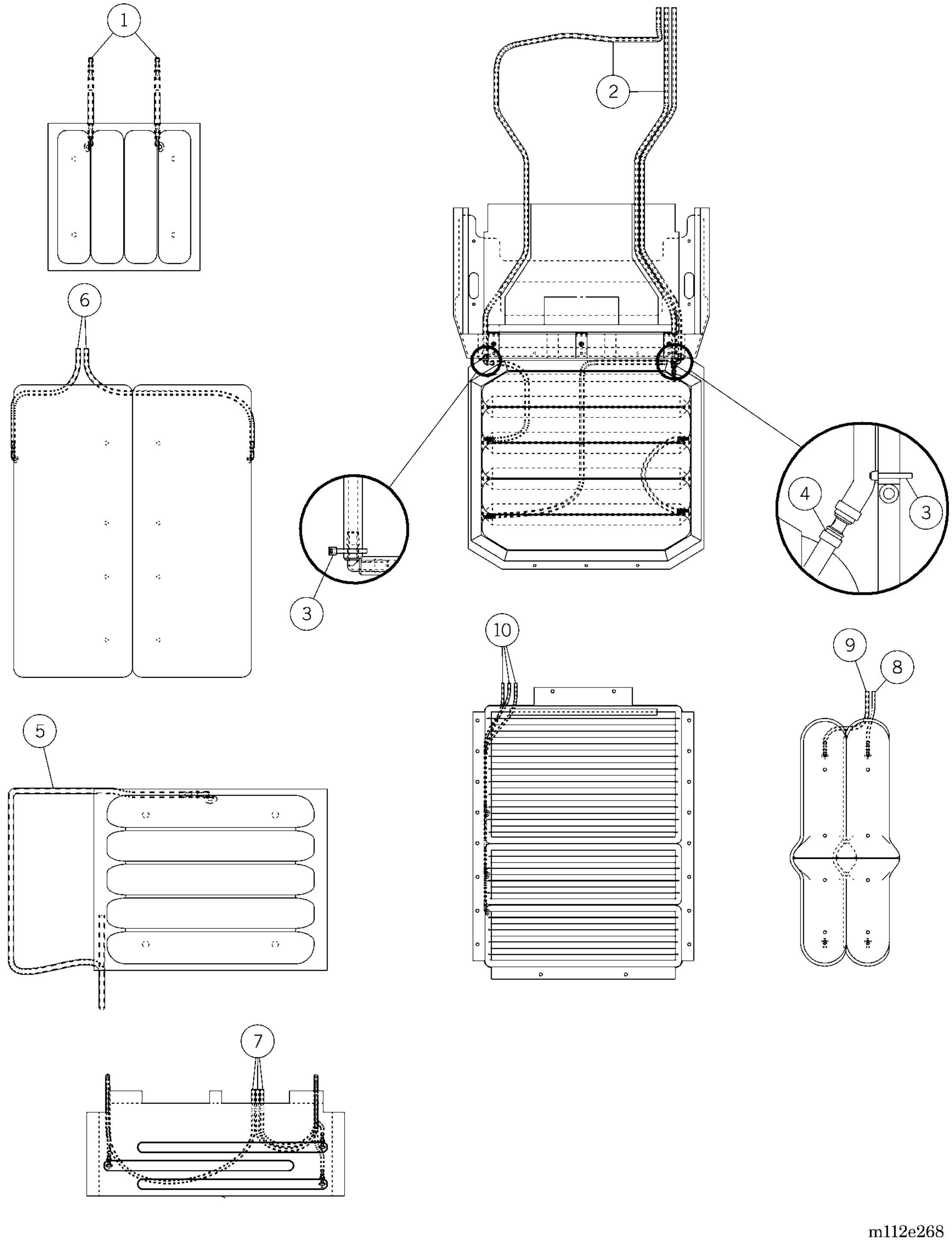
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Table 5-49. Pulmonary Surface Plumbing (P1900D Model)

Item Number	Part Number	Quantity	Description
1	66957 (1900)	1	Plumbing assembly, foot boost cushion (clear and blue)
2	66958 (1900)	1	Plumbing assembly, foot (foot cushion) (orange, gray, and purple)
3	19124 (1900)	2	Cable tie
4	67272 (1900)	1	Tubing ring clamp, ½" inside diameter
5	66963 (1900)	1	Plumbing assembly, head cushion, clear
6	66961 (1900)	1	Plumbing assembly, working cushion (green and yellow)
7	66964 (1900)	1	Plumbing assembly, percussion and vibration cushion
8	66960 (1900)	1	Plumbing assembly, boost cushion, lh (blue)
9	66959 (1900)	1	Plumbing assembly, boost cushion, rh (clear)
10	66962 (1900)	1	Plumbing assembly, treatment cushion

Pulmonary Surface Tubing Exit Plumbing (P1900D Model)

Figure 5-50. Pulmonary Surface Tubing Exit Plumbing (P1900D Model)

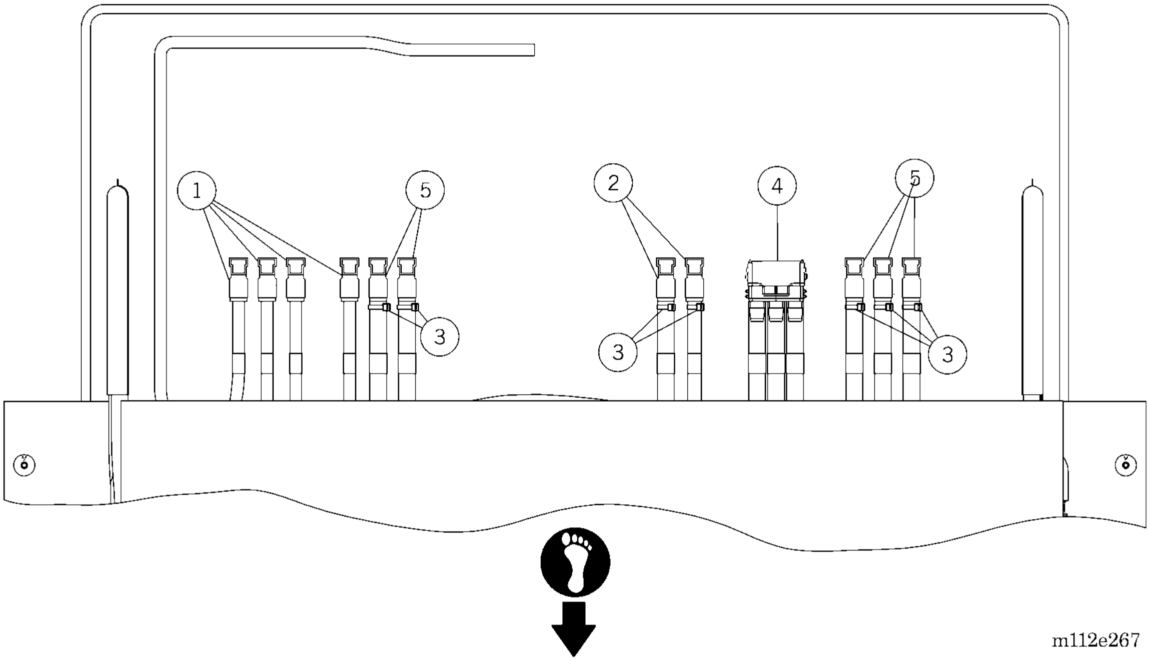

Table 5-50. Pulmonary Surface Tubing Exit Plumbing (P1900D Model)

Item Number	Part Number	Quantity	Description
1	4932901 (1900)	4	Quick disconnect, shroud body (treatment cushion (thigh—black, seat—red, and chest—white) and head cushion (clear))
2	66913 (1900)	2	Quick disconnect (boost cushion (right—clear, left—blue))
3	19124 (1900)	7	Cable tie
4	66685 (1900)	1	Percussion and vibration connector (percussion and vibration (clear))
5	4932902 (1900)	5	Quick disconnect, shrouded body (working cushion (right—green and left—yellow) and foot cushion (collapse—orange, retract—gray, and heel—purple)

NOTES:

IntelliDrive® Transport System (Sheet 1 of 2)

Figure 5-51. IntelliDrive® Transport System (Sheet 1 of 2)

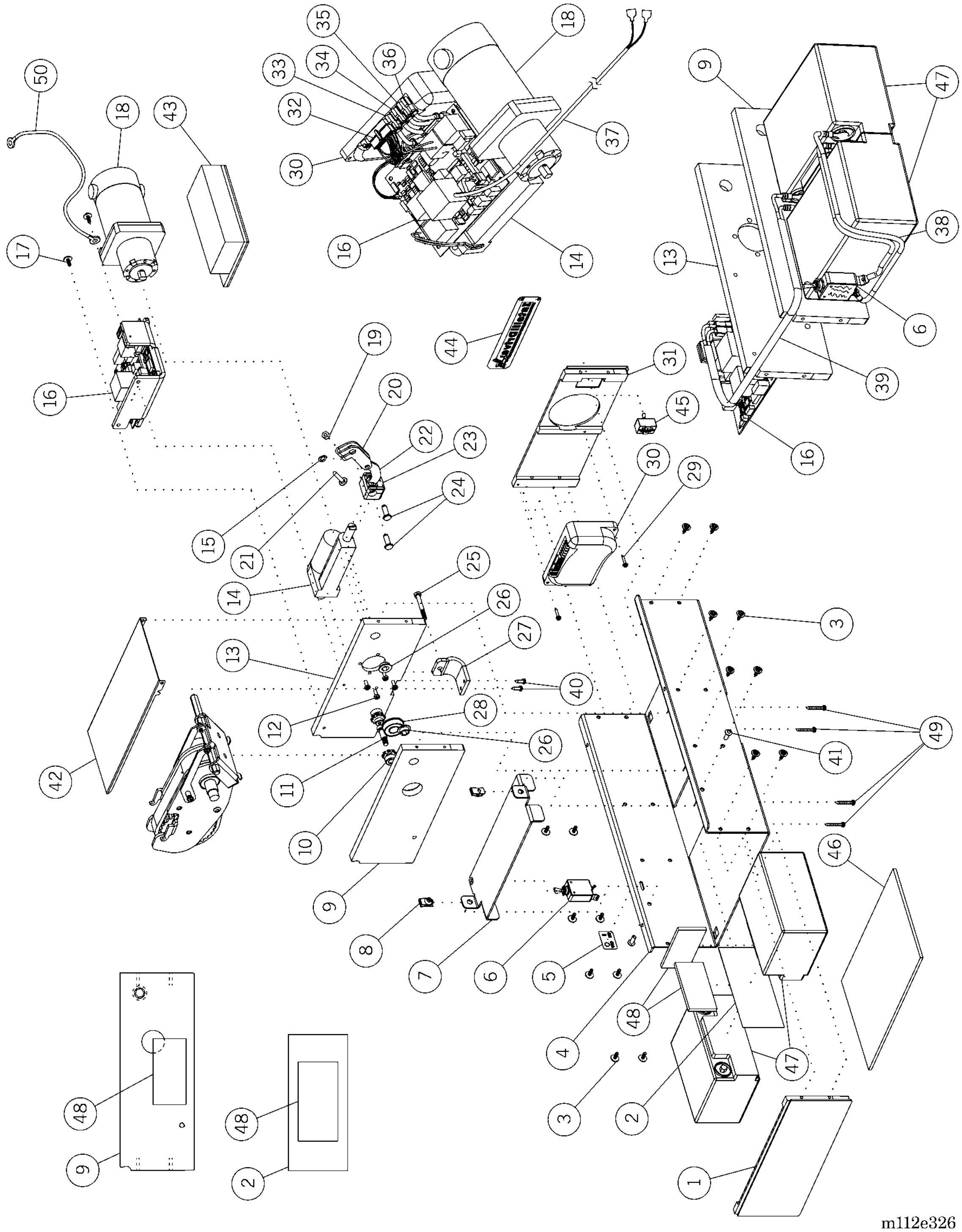
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Table 5-51. IntelliDrive® Transport System (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	68202 (1900)	1	End plate, battery side
2	68734 (1900)	1	Insulator, battery
3	47172 (1900)	16	Screw
4	68157 (1900)	1	Pan, drive unit
5	68797 (1900)	1	Label, ON/OFF toggle
6	68295 (1900)	1	Circuit breaker, 50 Amp, toggle
7	68370 (1900)	1	Bracket, battery retainer
8	44323 (1900)	2	U-nut
9	68206 (1900)	1	Plate, drive compartment
10	68306 (1900)	2	Sprocket
11	9025912 (1900)	2	Screw, shoulder
12	68488 (1900)	4	Screw
13	68836 (1900)	1	Motor mounting assembly
14	68298 (1900)	1	Linear actuator, HIWIN
15	3532501 (1900)	2	E-ring
16	68363 (1900)	1	PACM board assembly
17	47172 (1900)	2	Screw
18	68335 (1900)	1	Motor, gear, planetary, 24VDC, 400
19	4435 (1900)	1	Locknut
20	68212PL (1900)	1	Lever, linear actuator
21	4582202 (1900)	1	Bolt
22	68176 (1900)	1	Link, linear actuator
23	68489 (1900)	1	Guide, linear actuator
24	35306 (1900)	2	Hinge pin
25	9001830 (1900)	1	Screw
26	46416 (1900)	2	Hex bushing
27	68209 (1900)	1	Mounting strap, linear actuator
28	68284 (1900)	1	Bearing
29	49508 (1900)	2	Screw
30	68307 (1900)	1	Motor controller
31	68461 (1900)	1	End plate, motor side

Item Number	Part Number	Quantity	Description
32	68435 (1900)	1	Harness, motor controller logic
33	6843804 (1900)	1	Wire, motor controller (green)
34	6843803 (1900)	1	Wire, motor controller (white)
35	6843802 (1900)	1	Wire, motor controller (black)
36	6843801 (1900)	1	Wire, motor controller (red)
37	68367 (1900)	1	Cable, 23V DC input
38	68436 (1900)	1	Harness, circuit breaker
39	68437 (1900)	1	Harness, battery
40	63166 (1900)	2	Lobe, special head type, #23 screw
41	49521 (1900)	2	Screw
42	68379 (1900)	1	Cover, drive mechanism
43	68865 (1900)	1	Sound reducing kit
44	68874 (1900)	1	Label, override
45	68867 (1900)	1	Switch, toggle
46	68869 (1900)	1	Battery pad
47	68308 (1900)	2	Battery, 12V
48	68814 (1900)	2	Battery foam
49	47172 (1900)	4	Screw
50	3924001 (1900)	1	Ground strap assembly

NOTES:

IntelliDrive® Transport System (Sheet 2 of 2)

Figure 5-52. IntelliDrive® Transport System (Sheet 2 of 2)

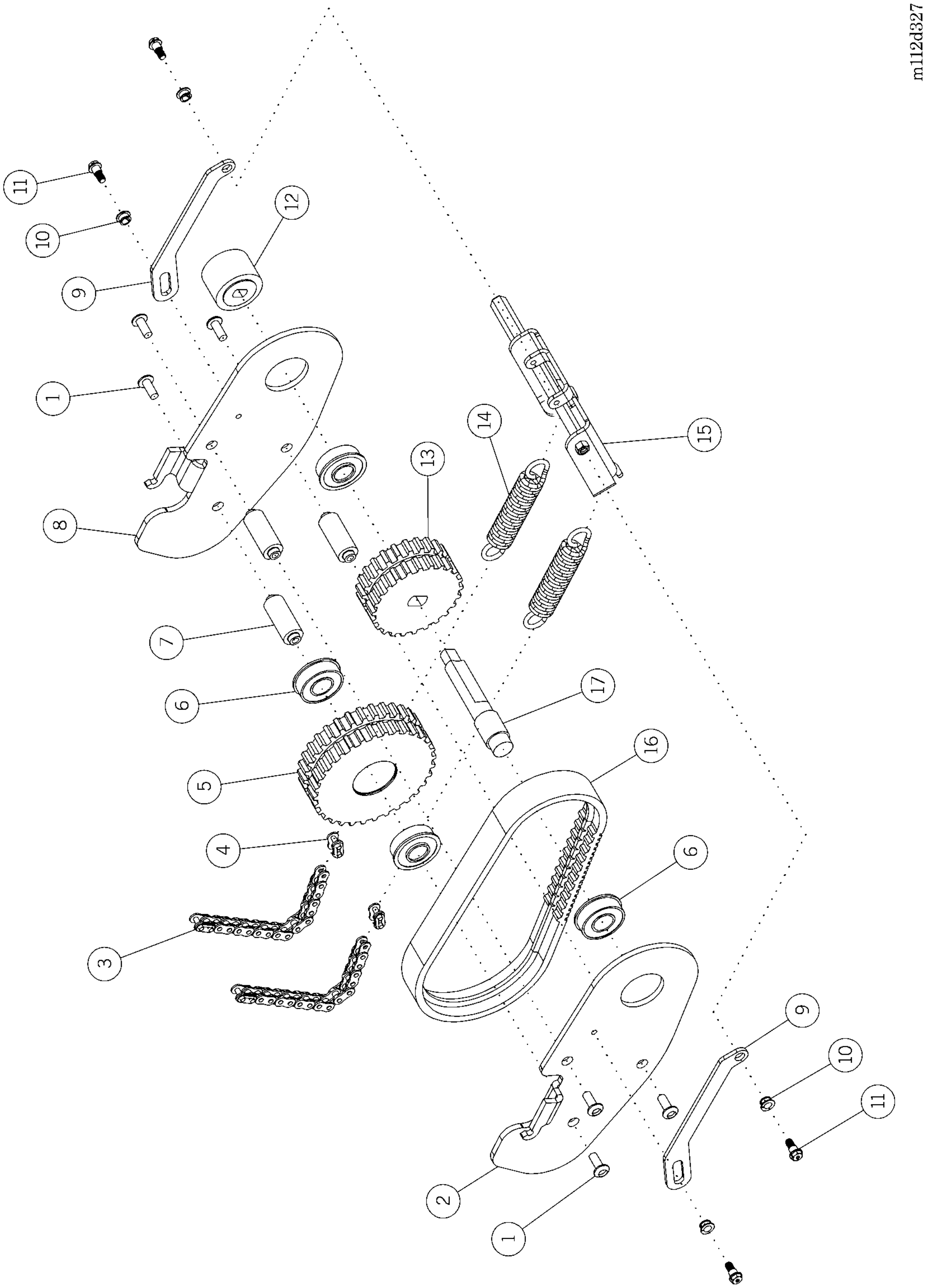
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Table 5-52. IntelliDrive® Transport System (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	49521 (1900)	6	Screw
2	6828801 (1900)	1	Pulley side plate, lh
3	68283 (1900)	2	Chain
4	68735 (1900)	2	Master link
5	68287 (1900)	1	Pulley, 32 teeth
6	68284 (1900)	4	Bearing
7	68290 (1900)	3	Driven pulley shaft
8	6828802 (1900)	1	Pulley side plate, rh
9	68294pl (1900)	2	Return link
10	68808 (1900)	4	Nyliner®[a] bearing
11	68809 (1900)	4	Screw, shoulder
12	68292 (1900)	1	Coupling drive
13	68286 (1900)	1	Pulley, 24 teeth
14	68235 (1900)	2	Spring, extension
15	68324 (1900)	1	Lever, spring weldment
16	68285 (1900)	1	Belt
17	68291 (1900)	1	Drive shaft

a. Nyliner® is a registered trademark of Thomson Industries, Inc.

Transport Handle Wiring—IntelliDrive® Transport System

Figure 5-53. Transport Handle Wiring—IntelliDrive® Transport System

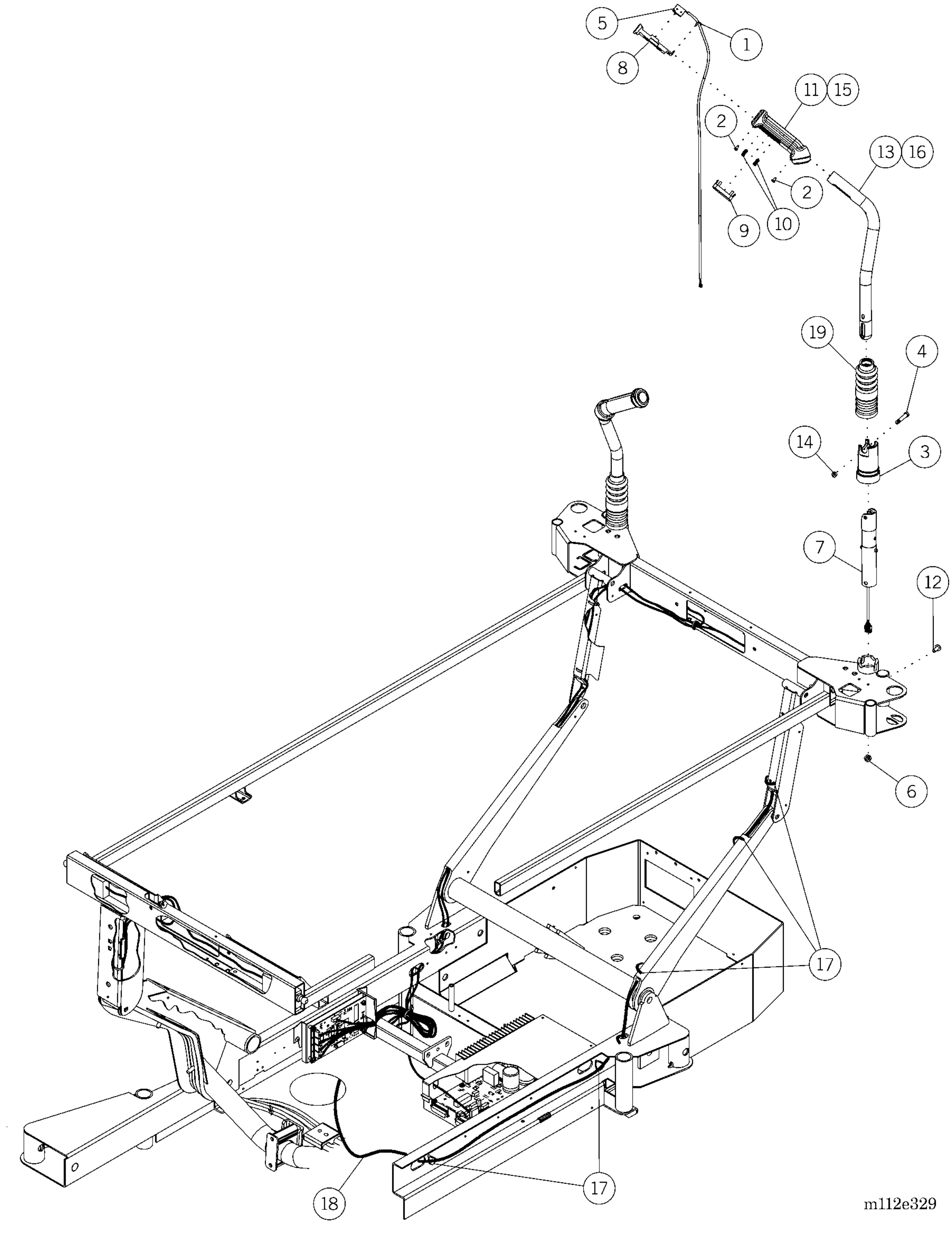
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Table 5-53. Transport Handle Wiring—IntelliDrive® Transport System

Item Number	Part Number	Quantity	Description
1	14450 (1900)	2	Cable tie, small
2	66876 (1900)	4	Screw
3	68301 (1900)	2	Coupler shield
4	68302 (1900)	2	Screw, shoulder
5	68303 (1900)	2	Handle, switch assembly
6	4435 (1900)	2	Locknut
7	68349 (1900)	2	Handle, strain gauge assembly
8	68351 (1900)	2	Enable switch housing
9	68352 (1900)	2	Enable switch button
10	68354 (1900)	4	Spring
11	6836201 (1900)	1	Handle grip, lh
12	49521 (1900)	2	Screw
13	6874401pl (1900)	1	Handle weldment, lh
14	777 (1900)	2	Locknut
15	6836202 (1900)	1	Handle grip, rh
16	6874402pl (1900)	1	Handle weldment, rh
17	19124 (1900)	5	Cable tie
18	68441 (1900)	1	Cable (PAG to PACM P.C. board)
19	69130 (1900)	2	Bellows, handle

Siderail Pads and Extenders

Figure 5-54. Siderail Pads and Extenders

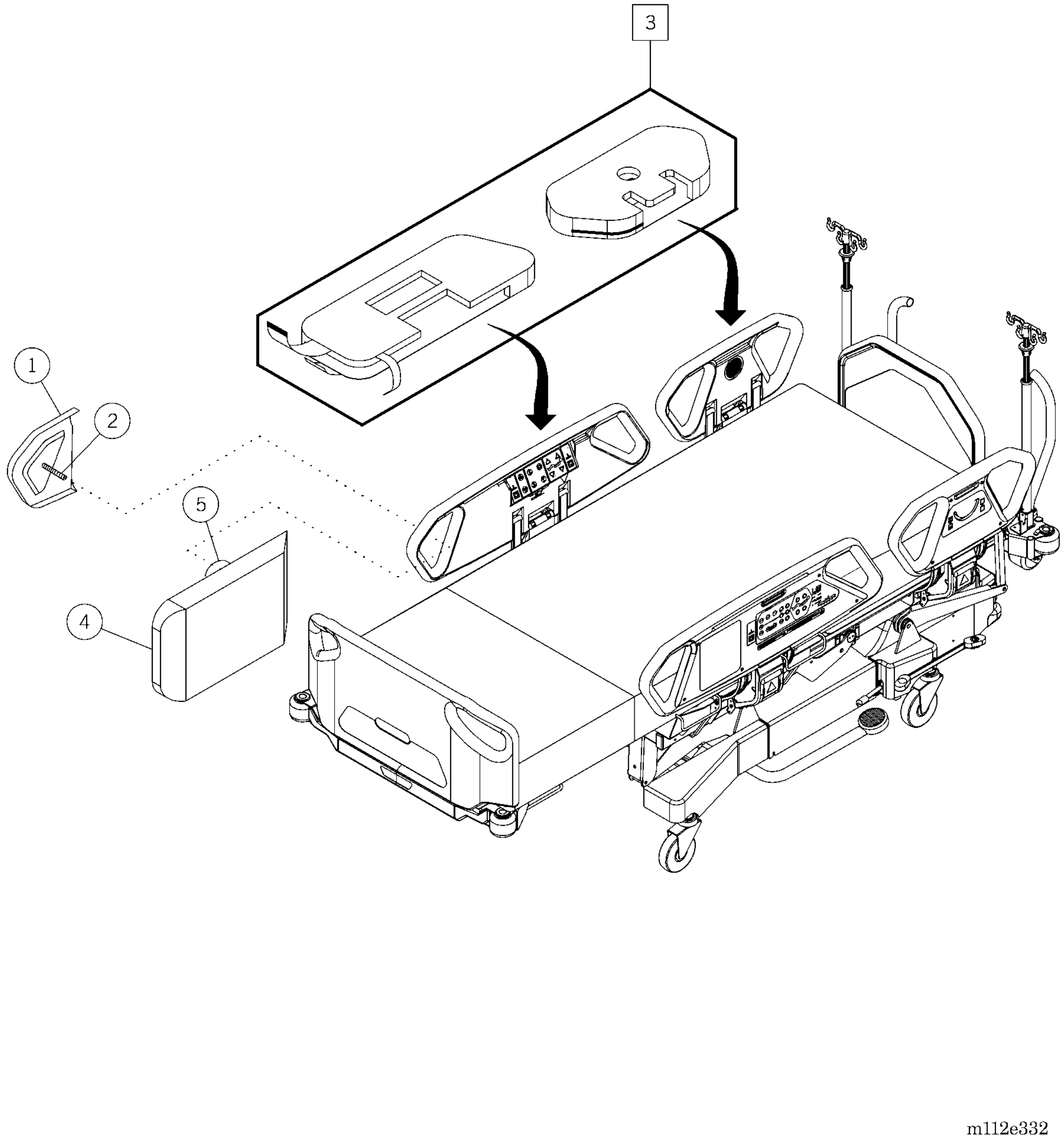

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Table 5-54. Siderail Pads and Extenders

Item Number	Part Number	Quantity	Description
1	6845401 (1900)	1	Siderail vacuum mold, lh
	6845402 (1900)	1	Siderail vacuum mold, rh
2	68455 (1900)	2	Tension knob
3	P1930EA02 (1900)	1	Siderail pads (set) (pulmonary surface)
	P1930EA01 (1900)	1	Siderail pads (set) (treatment and short stay surface)
4	P1949EA02 (1900)	1	Siderail extenders, TotalCare SpO_2RT® Pulmonary Therapy System (set) (pulmonary surface)
	P1949EA01 (1900)	1	Siderail extenders, TotalCare SpO_2RT® Pulmonary Therapy System (set) (treatment and short stay surface)
5	68863 (1900)	2	Tension stud

Component Layout and Parts List

The following component layout and parts list are available upon request:

Table 5-55. Component Layout and Parts List

Part Number	Description
6548701S (1900)	P.C. board assembly, weigh frame junction box
4703501 (1900)	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control micro
4703801 (1900)	P.C. board assembly, scale, TotalCare® Bed System
4704101 (1900)	Power/control P.C. board assembly
4705601 (1900)	Mattress control assembly
4705602 (1900)	Bed exit detection assembly
4735701 (1900)	Right caregiver positioning P.C. board assembly
4736001 (1900)	Left caregiver positioning P.C. board assembly
6407901 (1900)	P.C. board assembly, SideCom® Communication System nurse call
4736901 (1900)	Patient control enhanced entertainment, P.C. board
4739501 (1900)	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control switch
4847101 (1900)	P.C. board assembly, treatment foot surface control module
4742001 (1900)	Nurse call, P.C. board
4839201 (1900)	Patient positioning P.C. board and cable assembly (left)
4839202 (1900)	Patient entertainment P.C. board and cable assembly, lh
4839203 (1900)	P.C. board assembly—rh—patient positioning
4839204 (1900)	P.C. board assembly—rh—patient entertainment
4843301 (1900)	P.C. board assembly, bed up/down, TotalCare® Bed System
4843601 (1900)	P.C. board assembly, SideCom® Communication System entertainment/lighting
4847401 (1900)	P.C. board assembly, treatment surface control module

NOTES:

International Labels—Foot Prop, Transport Shelf, and Headboard

Figure 5-55. International Labels—Foot Prop, Transport Shelf, and Headboard

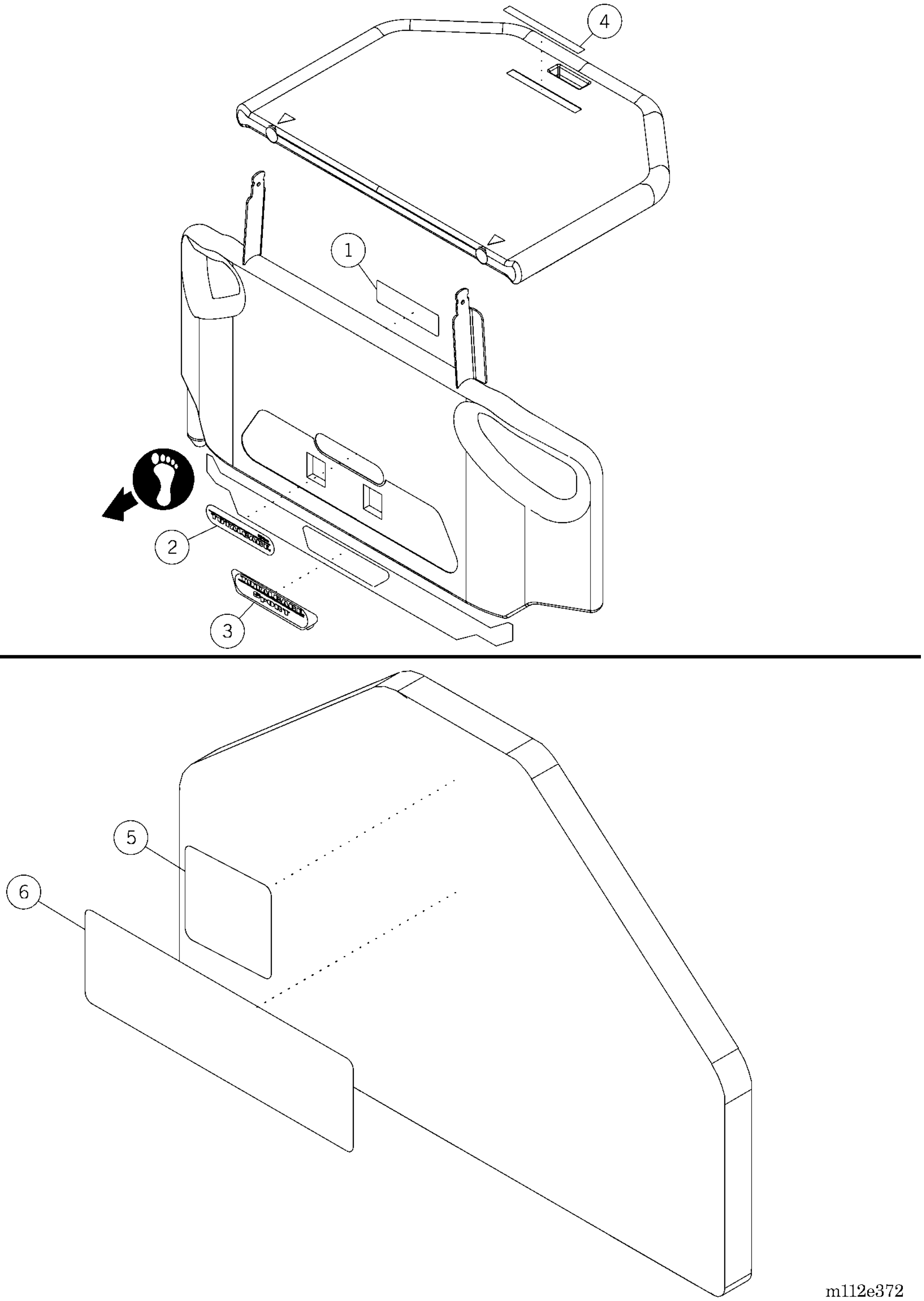

Table 5-56. International Labels—Foot Prop, Transport Shelf, and Headboard

Item Number	Part Number	Quantity	Description
1	49491101 (1900)	1	Label, stand or sit caution—English
	49491201 (1900)	1	Label, stand or sit caution—German
	49491301 (1900)	1	Label, stand or sit caution—French
	49491401 (1900)	1	Label, stand or sit caution—Spanish
	49491501 (1900)	1	Label, stand or sit caution—Portuguese
	49491601 (1900)	1	Label, stand or sit caution—Italian
	49491701 (1900)	1	Label, stand or sit caution—Dutch
	49491801 (1900)	1	Label, stand or sit caution—Swedish
	49491901 (1900)	1	Label, stand or sit caution—Arabic
	494911001 (1900)	1	Label, stand or sit caution—Chinese—Traditional
	494911101 (1900)	1	Label, stand or sit caution—Chinese—Simplified
	494911201 (1900)	1	Label, stand or sit caution—Japanese
	494911301 (1900)	1	Label, stand or sit caution—Greek
2	49513 (1900)	1	Nameplate
3	68753 (1900)	1	Label—TotalCare SpO_2RT® Pulmonary Therapy System (P1900D model only)
4	49530101 (1900)	1	Label group—English
	49530201 (1900)	1	Label group—German
	49530301 (1900)	1	Label group—French
	49530401 (1900)	1	Label group—Spanish
	49530501 (1900)	1	Label group—Portuguese
	49530601 (1900)	1	Label group—Italian
	49530701 (1900)	1	Label group—Dutch
	49530801 (1900)	1	Label group—Swedish
	49530901 (1900)	1	Label group—Arabic
	495301001 (1900)	1	Label group—Chinese—Traditional
	495301101 (1900)	1	Label group—Chinese—Simplified
	495301201 (1900)	1	Label group—Japanese

Item Number	Part Number	Quantity	Description
4 (continued)	495301301 (1900)	1	Label group—Greek
5	65049203 (1900)	1	Label, CPR board—German
	65049303 (1900)	1	Label, CPR board—French
	65049403 (1900)	1	Label, CPR board—Spanish
	65049503 (1900)	1	Label, CPR board—Portuguese
	65049603 (1900)	1	Label, CPR board—Italian
	65049703 (1900)	1	Label, CPR board—Dutch
	65049803 (1900)	1	Label, CPR board—Swedish
	65049903 (1900)	1	Label, CPR board—Arabic
	650491003 (1900)	1	Label, CPR board—Chinese—Traditional
	650491103 (1900)	1	Label, CPR board—Chinese—Simplified
	650491203 (1900)	1	Label, CPR board—Japanese
	650491303 (1900)	1	Label, CPR board—Greek
6	65049204 (1900)	1	Label, headboard warning—German
	65049304 (1900)	1	Label, headboard warning—French
	65049404 (1900)	1	Label, headboard warning—Spanish
	65049504 (1900)	1	Label, headboard warning—Portuguese
	65049604 (1900)	1	Label, headboard warning—Italian
	65049704 (1900)	1	Label, headboard warning—Dutch
	65049804 (1900)	1	Label, headboard warning—Swedish
	65049904 (1900)	1	Label, headboard warning—Arabic
	650491004 (1900)	1	Label, headboard warning—Chinese—Traditional
	650491104 (1900)	1	Label, headboard warning—Chinese—Simplified
	650491204 (1900)	1	Label, headboard warning—Japanese
	650491304 (1900)	1	Label, headboard warning—Greek

NOTES:

International Labels—Head End Siderail

Figure 5-56. International Labels—Head End Siderail

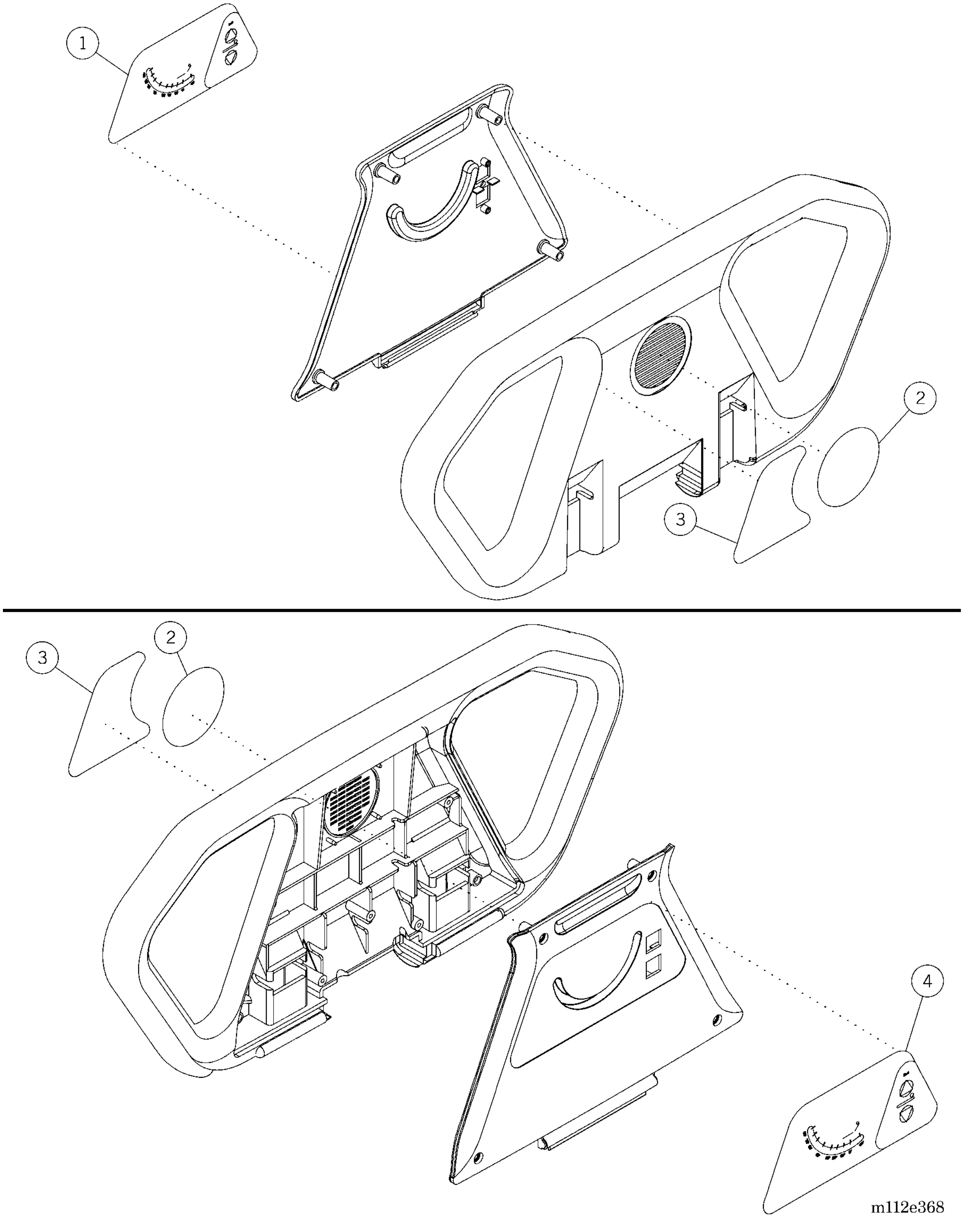

Table 5-57. International Labels—Head End Siderail

Item Number	Part Number	Quantity	Description
1	49109102 (1900)	1	Label, head angle/hilow, rh—English
	49109202 (1900)	1	Label, head angle/hilow, rh—German
	49109302 (1900)	1	Label, head angle/hilow, rh—French
	49109402 (1900)	1	Label, head angle/hilow, rh—Spanish
	49109502 (1900)	1	Label, head angle/hilow, rh—Portuguese
	49109602 (1900)	1	Label, head angle/hilow, rh—Italian
	49109702 (1900)	1	Label, head angle/hilow, rh—Dutch
	49109802 (1900)	1	Label, head angle/hilow, rh—Swedish
	49109902 (1900)	1	Label, head angle/hilow, rh—Arabic
	491091002 (1900)	1	Label, head angle/hilow, rh—Chinese—Traditional
	491091102 (1900)	1	Label, head angle/hilow, rh—Chinese—Simplified
	491091202 (1900)	1	Label, head angle/hilow, rh—Japanese
	491091302 (1900)	1	Label, head angle/hilow, rh—Greek
2	49453 (1900)	1	Label, blank speaker (beds **without** SideCom® Communication System only)
3	66937 (1900)	1	Label, pulmonary shoulder location, lh and rh (“D” model only)

Item Number	Part Number	Quantity	Description
4	49109101 (1900)	1	Label, head angle/hilow, lh—English
	49109201 (1900)	1	Label, head angle/hilow, lh—German
	49109301 (1900)	1	Label, head angle/hilow, lh—French
	49109401 (1900)	1	Label, head angle/hilow, lh—Spanish
	49109501 (1900)	1	Label, head angle/hilow, lh—Portuguese
	49109601 (1900)	1	Label, head angle/hilow, lh—Italian
	49109701 (1900)	1	Label, head angle/hilow, lh—Dutch
	49109801 (1900)	1	Label, head angle/hilow, lh—Swedish
	49109901 (1900)	1	Label, head angle/hilow, lh—Arabic
	491091001 (1900)	1	Label, head angle/hilow, lh—Chinese—Traditional
	491091101 (1900)	1	Label, head angle/hilow, lh—Chinese—Simplified
	491091201 (1900)	1	Label, head angle/hilow, lh—Japanese
	491091301 (1900)	1	Label, head angle/hilow, lh—Greek

NOTES:

International Labels—Right-Hand Intermediate Siderail

Figure 5-57. International Labels—Right-Hand Intermediate Siderails

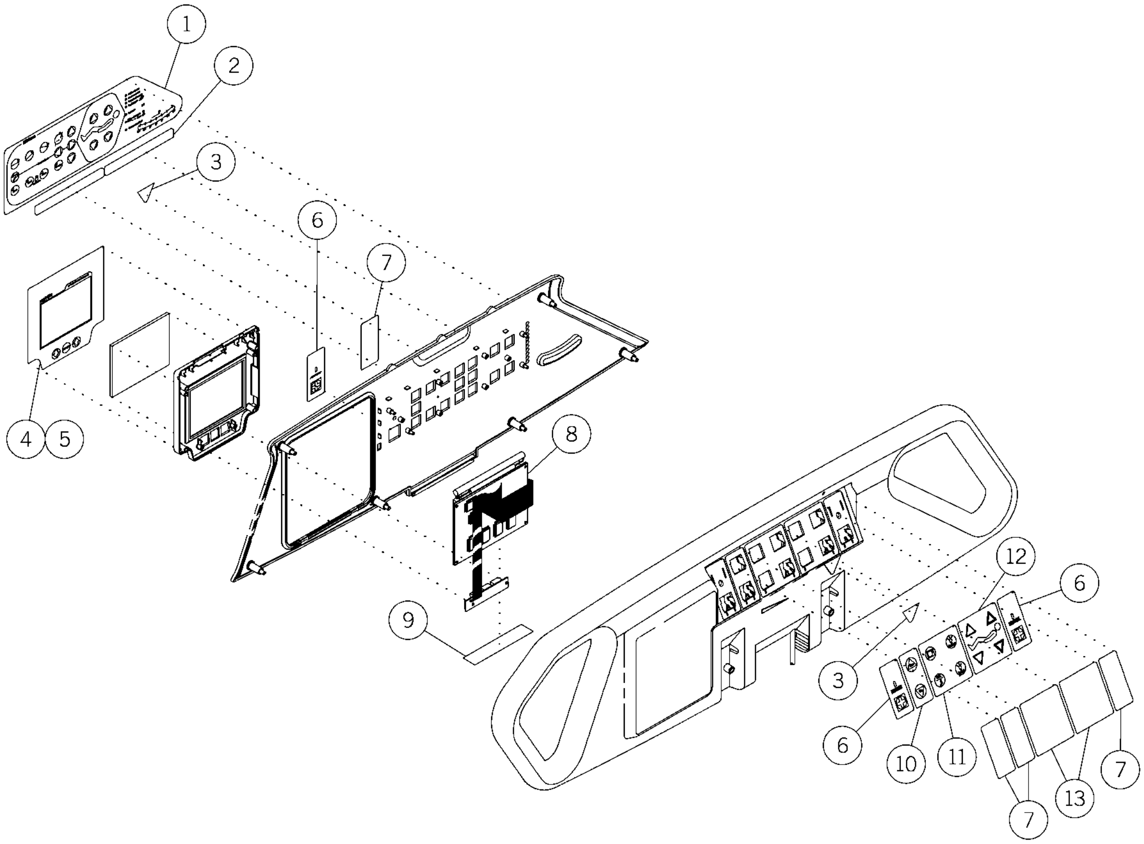

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Table 5-58. International Labels—Right-Hand Intermediate Siderails

Item Number	Part Number	Quantity	Description
1	49101102 (1900)	1	Label, caregiver control, rh—English
	49101202 (1900)	1	Label, caregiver control, rh—German
	49101302 (1900)	1	Label, caregiver control, rh—French
	49101402 (1900)	1	Label, caregiver control, rh—Spanish
	49101502 (1900)	1	Label, caregiver control, rh—Portuguese
	49101602 (1900)	1	Label, caregiver control, rh—Italian
	49101702 (1900)	1	Label, caregiver control, rh—Dutch
	49101802 (1900)	1	Label, caregiver control, rh—Swedish
	49101902 (1900)	1	Label, caregiver control, rh—Arabic
	491011002 (1900)	1	Label, caregiver control, rh—Chinese—Traditional
	491011102 (1900)	1	Label, caregiver control, rh—Chinese—Simplified
	491011202 (1900)	1	Label, caregiver control, rh—Japanese
	491011302 (1900)	1	Label, caregiver control, rh—Greek
2	65049102 (1900)	1	Label, siderail warning—English
	65049202 (1900)	1	Label, siderail warning—German
	65049302 (1900)	1	Label, siderail warning—French
	65049402 (1900)	1	Label, siderail warning—Spanish
	65049502 (1900)	1	Label, siderail warning—Portuguese
	65049602 (1900)	1	Label, siderail warning—Italian
	65049702 (1900)	1	Label, siderail warning—Dutch
	65049802 (1900)	1	Label, siderail warning—Swedish
	65049902 (1900)	1	Label, siderail warning—Arabic
	650491002 (1900)	1	Label, siderail warning—Chinese—Traditional
	650491102 (1900)	1	Label, siderail warning—Chinese—Simplified
	650491202 (1900)	1	Label, siderail warning—Japanese
	650491302 (1900)	1	Label, siderail warning—Greek

Item Number	Part Number	Quantity	Description
3	65262101 (1900)	2	Label, hip locator—English
	65262201 (1900)	2	Label, hip locator—German
	65262301 (1900)	2	Label, hip locator—French
	65262401 (1900)	2	Label, hip locator—Spanish
	65262501 (1900)	2	Label, hip locator—Portuguese
	65262601 (1900)	2	Label, hip locator—Italian
	65262701 (1900)	2	Label, hip locator—Dutch
	65262801 (1900)	2	Label, hip locator—Swedish
	65262901 (1900)	2	Label, hip locator—Arabic
	652621001 (1900)	2	Label, hip locator—Chinese—Traditional
	652621101 (1900)	2	Label, hip locator—Chinese—Simplified
	652621201 (1900)	2	Label, hip locator—Japanese
	652621301 (1900)	2	Label, hip locator—Greek
4	49108101 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—English
	49108201 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—German
	49108301 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—French
	49108401 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Spanish
	49108501 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Portuguese
	49108601 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Italian
	49108701 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Dutch
	49108801 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Swedish
	49108901 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Arabic

Item Number	Part Number	Quantity	Description
4 (continued)	491081001 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Chinese—Traditional
	491081101 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Chinese—Simplified
	491081201 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Japanese
	491081301 (1900)	1	Label, Graphical Caregiver Interface (GCI)® Control—Greek
	710491101 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Chinese—Simplified (OIML scale beds only)
	710491201 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Japanese (OIML scale beds only)
5	71049101 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—English (OIML scale beds only)
	71049201 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—German (OIML scale beds only)
	71049301 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—French (OIML scale beds only)
	71049401 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Spanish (OIML scale beds only)
	71049501 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Portuguese (OIML scale beds only)
	71049601 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Italian (OIML scale beds only)
	71049701 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Dutch (OIML scale beds only)

Item Number	Part Number	Quantity	Description
5 (continued)	71049801 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Swedish (OIML scale beds only)
	71049901 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Arabic (OIML scale beds only)
	710491001 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Chinese—Traditional (OIML scale beds only)
	710491301 (1900)	1	Label, OIML Graphical Caregiver Interface (GCI)® Control—Greek (OIML scale beds only)
6	49102101 (1900)	3	Label, Nurse Call—English (Nurse Call beds only)
	49102201 (1900)	3	Label, Nurse Call—German (Nurse Call beds only)
	49102301 (1900)	3	Label, Nurse Call—French (Nurse Call beds only)
	49102401 (1900)	3	Label, Nurse Call—Spanish (Nurse Call beds only)
	49102501 (1900)	3	Label, Nurse Call—Portuguese (Nurse Call beds only)
	49102601 (1900)	3	Label, Nurse Call—Italian (Nurse Call beds only)
	49102701 (1900)	3	Label, Nurse Call—Dutch (Nurse Call beds only)
	49102801 (1900)	3	Label, Nurse Call—Swedish (Nurse Call beds only)
	49102901 (1900)	3	Label, Nurse Call—Arabic (Nurse Call beds only)
	491021001 (1900)	3	Label, Nurse Call—Chinese—Traditional (Nurse Call beds only)
	491021101 (1900)	3	Label, Nurse Call—Chinese—Simplified (Nurse Call beds only)
	491021201 (1900)	3	Label, Nurse Call—Japanese (Nurse Call beds only)

Item Number	Part Number	Quantity	Description
6 (continued)	491021301 (1900)	3	Label, Nurse Call—Greek (Nurse Call beds only)
7	49451 (1900)	8 or 10	Label, blank two-button (beds **without** SideCom® Communication System and/or enhanced lighting and entertainment only)
8	47035102 (1900)	1	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control microprocessor—Region 1 (English, German, French, Chinese—Traditional and Simplified, and Japanese OIML scale beds only)
	47035202 (1900)	1	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control microprocessor—Region 2 (Dutch, Swedish, and Greek OIML scale beds only)
	47035302 (1900)	1	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control microprocessor—Region 3 (Spanish, Portuguese, and Italian OIML scale beds only)
	47035402 (1900)	1	P.C. board assembly, Graphical Caregiver Interface (GCI)® Control microprocessor—Region 4 (Arabic OIML scale beds only)
9	49480 (1900)	1	Label, electrostatic discharge (ESD) strip (OIML scale beds only)
10	49106-04 (1900)	1	Enhanced arrows, up and down

Item Number	Part Number	Quantity	Description
11	49106102 (1900)	1	Label, patient entertainment, rh—English (lighting and entertainment beds only)
	49106202 (1900)	1	Label, patient entertainment, rh—German (lighting and entertainment beds only)
	49106302 (1900)	1	Label, patient entertainment, rh—French (lighting and entertainment beds only)
	49106402 (1900)	1	Label, patient entertainment, rh—Spanish (lighting and entertainment beds only)
	49106502 (1900)	1	Label, patient entertainment, rh—Portuguese (lighting and entertainment beds only)
	49106602 (1900)	1	Label, patient entertainment, rh—Italian (lighting and entertainment beds only)
	49106702 (1900)	1	Label, patient entertainment, rh—Dutch (lighting and entertainment beds only)
	49106802 (1900)	1	Label, patient entertainment, rh—Swedish (lighting and entertainment beds only)
	49106902 (1900)	1	Label, patient entertainment, rh—Arabic (lighting and entertainment beds only)
	491061002 (1900)	1	Label, patient entertainment, rh—Chinese—Traditional (lighting and entertainment beds only)
	491061102 (1900)	1	Label, patient entertainment, rh—Chinese—Simplified (lighting and entertainment beds only)
	491061202 (1900)	1	Label, patient entertainment, rh—Japanese (lighting and entertainment beds only)
	491061302 (1900)	1	Label, patient entertainment, rh—Greek (lighting and entertainment beds only)

Item Number	Part Number	Quantity	Description
12	49492101 (1900)	1	Label, CPR/emergency Trendelenburg pedal—English and German
	49492201 (1900)	1	Label, CPR/emergency Trendelenburg warning—German
	49492301 (1900)	1	Label, CPR/emergency Trendelenburg pedal—French
	49492401 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Spanish
	49492501 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Portuguese
	49492601 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Italian
	49492701 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Dutch
	49492801 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Swedish
	49492901 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Arabic
	494921001 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Chinese—Traditional
	494921101 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Chinese—Simplified
	494921201 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Japanese
	494921301 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Greek
13	49452 (1900)	2 or 4	Label, blank four-button (beds **without** SideCom® Communication System, lighting and entertainment, and/or patient positioning only)

International Labels—Left-Hand Intermediate Siderail

Figure 5-58. International Labels—Left-Hand Intermediate Siderail

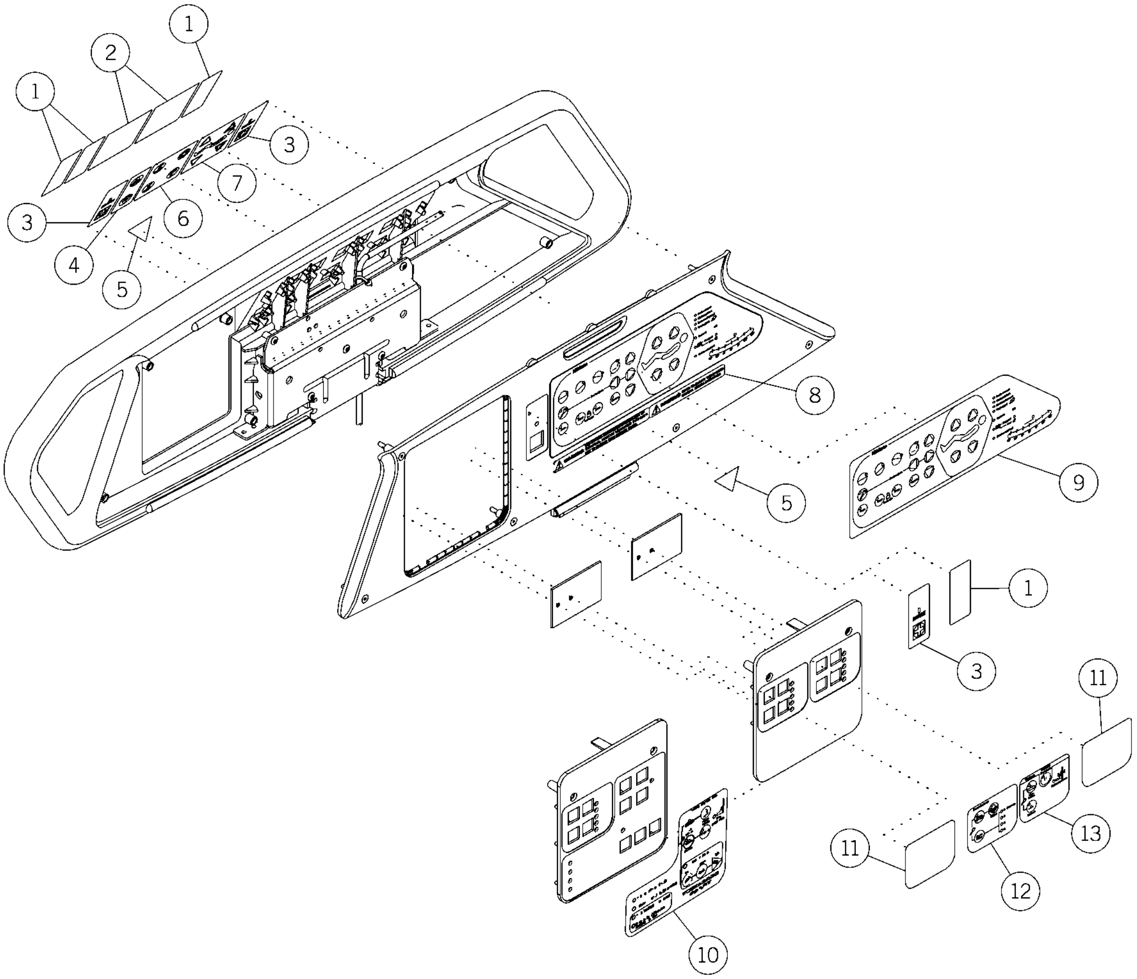

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Table 5-59. International Labels—Left-Hand Intermediate Siderail

Item Number	Part Number	Quantity	Description
1	49451 (1900)	8 or 10	Label, blank two-button (beds **without** SideCom® Communication System and/or enhanced lighting and entertainment only)
2	49452 (1900)	2 or 4	Label, blank four-button (beds **without** SideCom® Communication System, lighting and entertainment, and/or patient positioning only)
3	49102101 (1900)	3	Label, Nurse Call—English (Nurse Call beds only)
	49102201 (1900)	3	Label, Nurse Call—German (Nurse Call beds only)
	49102301 (1900)	3	Label, Nurse Call—French (Nurse Call beds only)
	49102401 (1900)	3	Label, Nurse Call—Spanish (Nurse Call beds only)
	49102501 (1900)	3	Label, Nurse Call—Portuguese (Nurse Call beds only)
	49102601 (1900)	3	Label, Nurse Call—Italian (Nurse Call beds only)
	49102701 (1900)	3	Label, Nurse Call—Dutch (Nurse Call beds only)
	49102801 (1900)	3	Label, Nurse Call—Swedish (Nurse Call beds only)
	49102901 (1900)	3	Label, Nurse Call—Arabic (Nurse Call beds only)
	491021001 (1900)	3	Label, Nurse Call—Chinese—Traditional (Nurse Call beds only)
	491021101 (1900)	3	Label, Nurse Call—Chinese—Simplified (Nurse Call beds only)
	491021201 (1900)	3	Label, Nurse Call—Japanese (Nurse Call beds only)
	491021301 (1900)	3	Label, Nurse Call—Greek (Nurse Call beds only)
4	49106-04 (1900)	1	Enhanced arrows, up and down

Item Number	Part Number	Quantity	Description
5	65262101 (1900)	2	Label, hip locator—English
	65262201 (1900)	2	Label, hip locator—German
	65262301 (1900)	2	Label, hip locator—French
	65262401 (1900)	2	Label, hip locator—Spanish
	65262501 (1900)	2	Label, hip locator—Portuguese
	65262601 (1900)	2	Label, hip locator—Italian
	65262701 (1900)	2	Label, hip locator—Dutch
	65262801 (1900)	2	Label, hip locator—Swedish
	65262901 (1900)	2	Label, hip locator—Arabic
	652621001 (1900)	2	Label, hip locator—Chinese—Traditional
	652621101 (1900)	2	Label, hip locator—Chinese—Simplified
	652621201 (1900)	2	Label, hip locator—Japanese
	652621301 (1900)	2	Label, hip locator—Greek

Item Number	Part Number	Quantity	Description
6	49106101 (1900)	1	Label, patient entertainment, lh—English (lighting and entertainment beds only)
	49106201 (1900)	1	Label, patient entertainment, lh—German (lighting and entertainment beds only)
	49106301 (1900)	1	Label, patient entertainment, lh—French (lighting and entertainment beds only)
	49106401 (1900)	1	Label, patient entertainment, lh—Spanish (lighting and entertainment beds only)
	49106501 (1900)	1	Label, patient entertainment, lh—Portuguese (lighting and entertainment beds only)
	49106601 (1900)	1	Label, patient entertainment, lh—Italian (lighting and entertainment beds only)
	49106701 (1900)	1	Label, patient entertainment, lh—Dutch (lighting and entertainment beds only)
	49106801 (1900)	1	Label, patient entertainment, lh—Swedish (lighting and entertainment beds only)
	49106901 (1900)	1	Label, patient entertainment, lh—Arabic (lighting and entertainment beds only)
	491061001 (1900)	1	Label, patient entertainment, lh—Chinese—Traditional (lighting and entertainment beds only)
	491061101 (1900)	1	Label, patient entertainment, lh—Chinese—Simplified (lighting and entertainment beds only)
	491061201 (1900)	1	Label, patient entertainment, lh—Japanese (lighting and entertainment beds only)
	491061301 (1900)	1	Label, patient entertainment, lh—Greek (lighting and entertainment beds only)
7	49107-01 (1900)	1	Label, patient articulation, lh

Item Number	Part Number	Quantity	Description
8	65049102 (1900)	1	Label, siderail warning—English
	65049202 (1900)	1	Label, siderail warning—German
	65049302 (1900)	1	Label, siderail warning—French
	65049402 (1900)	1	Label, siderail warning—Spanish
	65049502 (1900)	1	Label, siderail warning—Portuguese
	65049602 (1900)	1	Label, siderail warning—Italian
	65049702 (1900)	1	Label, siderail warning—Dutch
	65049802 (1900)	1	Label, siderail warning—Swedish
	65049902 (1900)	1	Label, siderail warning—Arabic
	650491002 (1900)	1	Label, siderail warning—Chinese—Traditional
	650491102 (1900)	1	Label, siderail warning—Chinese—Simplified
	650491202 (1900)	1	Label, siderail warning—Japanese
	650491302 (1900)	1	Label, siderail warning—Greek
9	49101101 (1900)	1	Label, caregiver control, lh—English
	49101201 (1900)	1	Label, caregiver control, lh—German
	49101301 (1900)	1	Label, caregiver control, lh—French
	49101401 (1900)	1	Label, caregiver control, lh—Spanish
	49101501 (1900)	1	Label, caregiver control, lh—Portuguese
	49101601 (1900)	1	Label, caregiver control, lh—Italian
	49101701 (1900)	1	Label, caregiver control, lh—Dutch
	49101801 (1900)	1	Label, caregiver control, lh—Swedish
	49101901 (1900)	1	Label, caregiver control, lh—Arabic
	491011001 (1900)	1	Label, caregiver control, lh—Chinese—Traditional
	491011101 (1900)	1	Label, caregiver control, lh—Chinese—Simplified
	491011201 (1900)	1	Label, caregiver control, lh—Japanese
	491011301 (1900)	1	Label, caregiver control, lh—Greek

Item Number	Part Number	Quantity	Description
10	49104112 (1900)	1	Label, pulmonary head panel—English (P1900D model only)
	49104212 (1900)	1	Label, pulmonary head panel—German (P1900D model only)
	49104312 (1900)	1	Label, pulmonary head panel—French (P1900D model only)
	49104412 (1900)	1	Label, pulmonary head panel—Spanish (P1900D model only)
	49104512 (1900)	1	Label, pulmonary head panel—Portuguese (P1900D model only)
	49104612 (1900)	1	Label, pulmonary head panel—Italian (P1900D model only)
	49104712 (1900)	1	Label, pulmonary head panel—Dutch (P1900D model only)
	49104812 (1900)	1	Label, pulmonary head panel—Swedish (P1900D model only)
	49104912 (1900)	1	Label, pulmonary head panel—Arabic (P1900D model only)
	491041012 (1900)	1	Label, pulmonary head panel—Chinese—Traditional (P1900D model only)
	491041112 (1900)	1	Label, pulmonary head panel—Chinese—Simplified (P1900D model only)
	491041212 (1900)	1	Label, pulmonary head panel—Japanese (P1900D model only)
	491041312 (1900)	1	Label, pulmonary head panel—Greek (P1900D model only)
11	49105 (1900)	1 or 2	Label, blank setup (short stay surface beds or beds **without** patient exit only)

Item Number	Part Number	Quantity	Description
12	49103101 (1900)	1	Label, bed exit—English (bed exit beds only)
	49103201 (1900)	1	Label, bed exit—German (bed exit beds only)
	49103301 (1900)	1	Label, bed exit—French (bed exit beds only)
	49103401 (1900)	1	Label, bed exit—Spanish (bed exit beds only)
	49103501 (1900)	1	Label, bed exit—Portuguese (bed exit beds only)
	49103601 (1900)	1	Label, bed exit—Italian (bed exit beds only)
	49103701 (1900)	1	Label, bed exit—Dutch (bed exit beds only)
	49103801 (1900)	1	Label, bed exit—Swedish (bed exit beds only)
	49103901 (1900)	1	Label, bed exit—Arabic (bed exit beds only)
	491031001 (1900)	1	Label, bed exit—Chinese—Traditional (bed exit beds only)
	491031101 (1900)	1	Label, bed exit—Chinese—Simplified (bed exit beds only)
	491031201 (1900)	1	Label, bed exit—Japanese (bed exit beds only)
	491031301 (1900)	1	Label, bed exit—Greek (bed exit beds only)

Item Number	Part Number	Quantity	Description
13	49104101 (1900)	1	Label, surface controls—English (prevention surface beds only)
	49104201 (1900)	1	Label, surface controls—German (prevention surface beds only)
	49104301 (1900)	1	Label, surface controls—French (prevention surface beds only)
	49104401 (1900)	1	Label, surface controls—Spanish (prevention surface beds only)
	49104501 (1900)	1	Label, surface controls—Portuguese (prevention surface beds only)
	49104601 (1900)	1	Label, surface controls—Italian (prevention surface beds only)
	49104701 (1900)	1	Label, surface controls—Dutch (prevention surface beds only)
	49104801 (1900)	1	Label, surface controls—Swedish (prevention surface beds only)
	49104901 (1900)	1	Label, surface controls—Arabic (prevention surface beds only)
	491041001 (1900)	1	Label, surface controls—Chinese—Traditional (prevention surface beds only)
	491041101 (1900)	1	Label, surface controls—Chinese—Simplified (prevention surface beds only)
	491041201 (1900)	1	Label, surface controls—Japanese (prevention surface beds only)
	491041301 (1900)	1	Label, surface controls—Greek (prevention surface beds only)

International Labels—Base Frame and Covers

Figure 5-59. International Labels—Base Frame and Covers

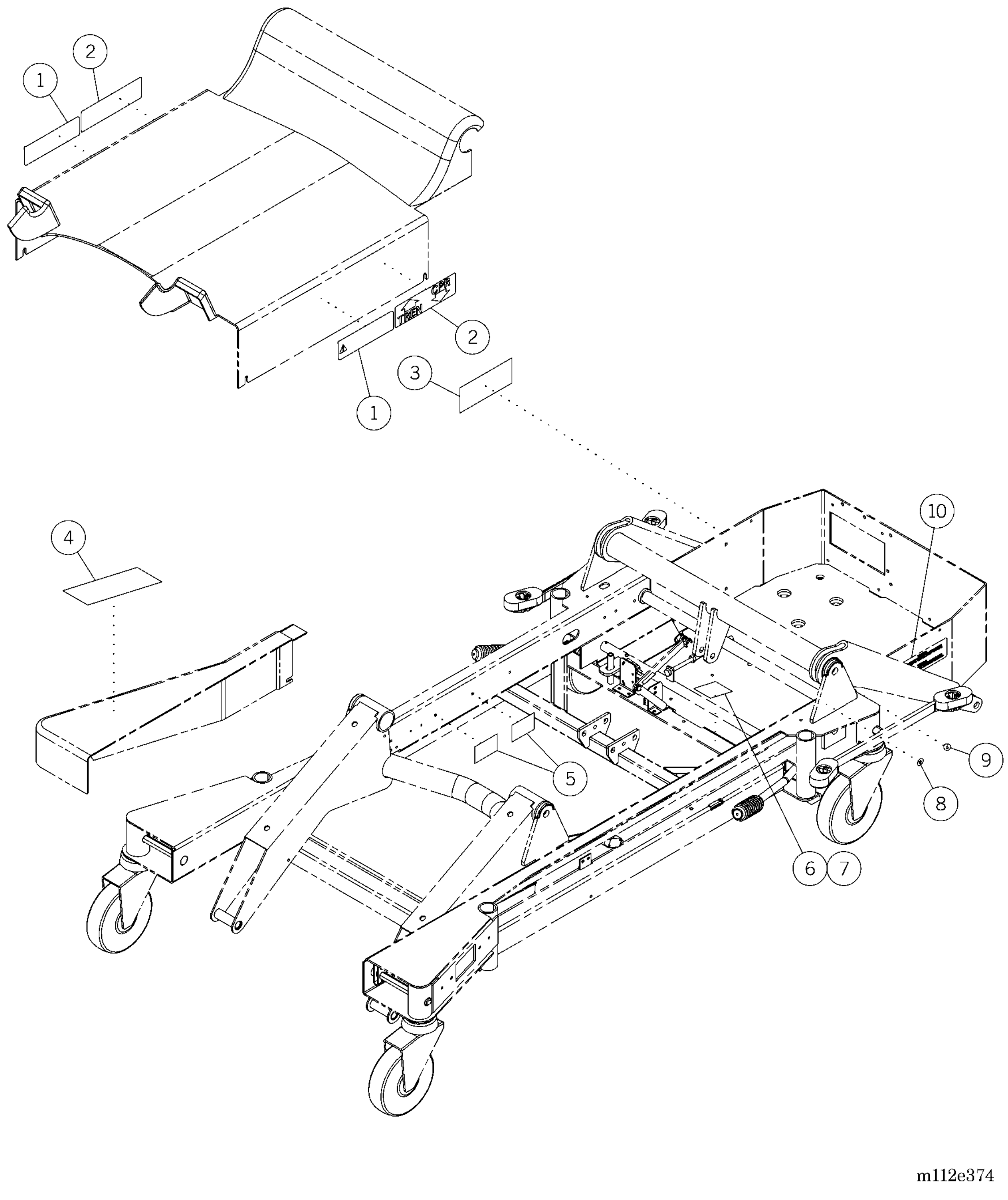
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Table 5-60. International Labels—Base Frame and Covers

Item Number	Part Number	Quantity	Description
1	49487101 (1900)	2	Label, emergency Trendelenburg warning—English (beds **without** foot pump only)
	49487201 (1900)	2	Label, emergency Trendelenburg warning—German (beds **without** foot pump only)
	49487301 (1900)	2	Label, emergency Trendelenburg warning—French (beds **without** foot pump only)
	49487401 (1900)	2	Label, emergency Trendelenburg warning—Spanish (beds **without** foot pump only)
	49487501 (1900)	2	Label, emergency Trendelenburg warning—Portuguese (beds **without** foot pump only)
	49487601 (1900)	2	Label, emergency Trendelenburg warning—Italian (beds **without** foot pump only)
	49487701 (1900)	2	Label, emergency Trendelenburg warning—Dutch (beds **without** foot pump only)
	49487801 (1900)	2	Label, emergency Trendelenburg warning—Swedish (beds **without** foot pump only)
2	49492101 (1900)	2	Label, CPR/emergency Trendelenburg pedal—English
	49492201 (1900)	2	Label, CPR/emergency Trendelenburg warning—German
	49492301 (1900)	2	Label, CPR/emergency Trendelenburg pedal—French
	49492401 (1900)	2	Label, CPR/emergency Trendelenburg pedal—Spanish
	49492501 (1900)	2	Label, CPR/emergency Trendelenburg pedal—Portuguese
	49492601 (1900)	2	Label, CPR/emergency Trendelenburg pedal—Italian

Item Number	Part Number	Quantity	Description
2 (continued)	49492701 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Dutch
	49492801 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Swedish
	49492901 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Arabic
	494921001 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Chinese—Traditional
	494921101 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Chinese—Simplified
	494921201 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Japanese
	494921301 (1900)	1	Label, CPR/emergency Trendelenburg pedal—Greek
3	62746 (1900)	1	Label, caution (English accessory receptacle beds only)
4	49489 (1900)	1	Label, receptacle capacity (English accessory receptacle beds only)
5	71046 (1900)	2	Label, scale seal (OIML scale beds only)
6	69347101 (1900)	1	Label, fuse, 120V bed—English
	69347401 (1900)	1	Label, fuse, 120V bed—Spanish
	69347501 (1900)	1	Label, fuse, 120V bed—Portuguese
	69347901 (1900)	1	Label, fuse, 120V bed—Arabic
	693471001 (1900)	1	Label, fuse, 120V bed—Chinese—Traditional
	693471201 (1900)	1	Label, fuse, 120V bed—Japanese

Item Number	Part Number	Quantity	Description
7	69348101 (1900)	1	Label, fuse, 230V bed—English
	69348201 (1900)	1	Label, fuse, 230V bed—German
	69348301 (1900)	1	Label, fuse, 230V bed—French
	69348401 (1900)	1	Label, fuse, 230V bed—Spanish
	69348501 (1900)	1	Label, fuse, 230V bed—Portuguese
	69348601 (1900)	1	Label, fuse, 230V bed—Italian
	69348701 (1900)	1	Label, fuse, 230V bed—Dutch
	69348801 (1900)	1	Label, fuse, 230V bed—Swedish
	69348901 (1900)	1	Label, fuse, 230V bed—Arabic
	693481001 (1900)	1	Label, fuse, 230V bed—Chinese—Traditional
	693481101 (1900)	1	Label, fuse, 230V bed—Chinese—Simplified
	693481301 (1900)	1	Label, fuse, 230V bed—Greek
8	44002 (1900)	1	Label, protective earth
9	44464 (1900)	1	Label, patental equalization
10	49486101 (1900)	1	Label, ground caution—English
	49486201 (1900)	1	Label, ground caution—German
	49486301 (1900)	1	Label, ground caution—French
	49486401 (1900)	1	Label, ground caution—Spanish
	49486501 (1900)	1	Label, ground caution—Portuguese
	49486601 (1900)	1	Label, ground caution—Italian
	49486701 (1900)	1	Label, ground caution—Dutch
	49486801 (1900)	1	Label, ground caution—Swedish
	49486901 (1900)	1	Label, ground caution—Arabic
	494861001 (1900)	1	Label, ground caution—Chinese—Traditional
	494861101 (1900)	1	Label, ground caution—Chinese—Simplified
	494861201 (1900)	1	Label, ground caution—Japanese
	494861301 (1900)	1	Label, ground caution—Greek

International Labels—Head End

Figure 5-60. International Labels—Head End

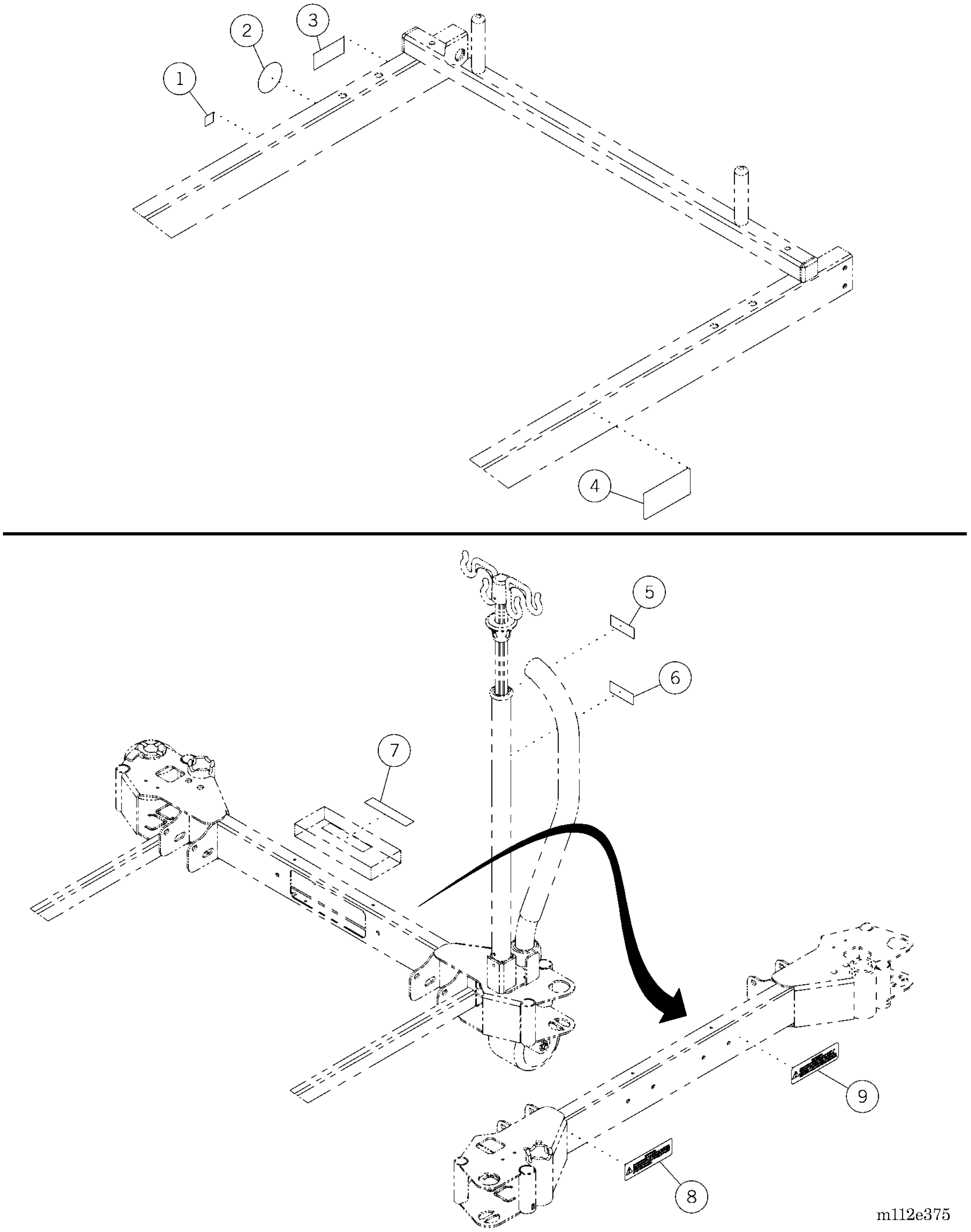
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Table 5-61. International Labels—Head End

Item Number	Part Number	Quantity	Description
1	46960 (1900)	1	Label, consult accompanying documentation
2	46770 (1900)	1	Label, CE (International beds **without** scale only)
	64068 (1900)	1	Label, CE with TUV identification (International beds **with** scale only)
3	42446 (1900)	1	Label, VDE
4	63551 (1900)	1	Label, patent marking
5	49495101 (1900)	2	Label, IV pump mounting—English (permanent IV pole beds only)
	49495201 (1900)	2	Label, IV pump mounting—German (permanent IV pole beds only)
	49495301 (1900)	2	Label, IV pump mounting—French (permanent IV pole beds only)
	49495401 (1900)	2	Label, IV pump mounting—Spanish (permanent IV pole beds only)
	49495501 (1900)	2	Label, IV pump mounting—Portuguese (permanent IV pole beds only)
	49495601 (1900)	2	Label, IV pump mounting—Italian (permanent IV pole beds only)
	49495701 (1900)	2	Label, IV pump mounting—Dutch (permanent IV pole beds only)
	49495801 (1900)	2	Label, IV pump mounting—Swedish (permanent IV pole beds only)
	49495901 (1900)	2	Label, IV pump mounting—Arabic (permanent IV pole beds only)
	494951001 (1900)	2	Label, IV pump mounting—Chinese—Traditional (permanent IV pole beds only)
	494951101 (1900)	2	Label, IV pump mounting—Chinese—Simplified (permanent IV pole beds only)
	494951201 (1900)	2	Label, IV pump mounting—Japanese (permanent IV pole beds only)

Item Number	Part Number	Quantity	Description
5 (continued)	494951301 (1900)	2	Label, IV pump mounting—Greek (permanent IV pole beds only)
6	67090-07 (1900)	2	Label, swivel, infusion support (permanent IV pole beds only)
7	65049201 (1900)	1	Label, SideCom® Communication System warning—German (Nurse Call beds only)
	65049301 (1900)	1	Label, SideCom® Communication System warning—French (Nurse Call beds only)
	65049401 (1900)	1	Label, SideCom® Communication System warning—Spanish (Nurse Call beds only)
	65049501 (1900)	1	Label, SideCom® Communication System warning—Portuguese (Nurse Call beds only)
	65049601 (1900)	1	Label, SideCom® Communication System warning—Italian (Nurse Call beds only)
	65049701 (1900)	1	Label, SideCom® Communication System warning—Dutch (Nurse Call beds only)
	65049801 (1900)	1	Label, SideCom® Communication System warning—Swedish (Nurse Call beds only)
	65049901 (1900)	1	Label, SideCom® Communication System warning—Arabic (Nurse Call beds only)
	650491001 (1900)	1	Label, SideCom® Communication System warning—Chinese—Traditional (Nurse Call beds only)
	650491101 (1900)	1	Label, SideCom® Communication System warning—Chinese—Simplified (Nurse Call beds only)
	650491201 (1900)	1	Label, SideCom® Communication System warning—Japanese (Nurse Call beds only)

Item Number	Part Number	Quantity	Description
7 (continued)	650491301 (1900)	1	Label, SideCom® Communication System warning—Greek (Nurse Call beds only)
8	49485101 (1900)	1	Label, head end capacity—English
	49485201 (1900)	1	Label, head end capacity—German
	49485301 (1900)	1	Label, head end capacity—French
	49485401 (1900)	1	Label, head end capacity—Spanish
	49485501 (1900)	1	Label, head end capacity—Portuguese
	49485601 (1900)	1	Label, head end capacity—Italian
	49485701 (1900)	1	Label, head end capacity—Dutch
	49485801 (1900)	1	Label, head end capacity—Swedish
	49485901 (1900)	1	Label, head end capacity—Arabic
	494851001 (1900)	1	Label, head end capacity—Chinese—Traditional
	494851101 (1900)	1	Label, head end capacity—Chinese—Simplified
	494851201 (1900)	1	Label, head end capacity—Japanese
	494851301 (1900)	1	Label, head end capacity—Greek
9	49484101 (1900)	1	Label, trapeze caution—English
	49484201 (1900)	1	Label, trapeze caution—German
	49484301 (1900)	1	Label, trapeze caution—French
	49484401 (1900)	1	Label, trapeze caution—Spanish
	49484501 (1900)	1	Label, trapeze caution—Portuguese
	49484601 (1900)	1	Label, trapeze caution—Italian
	49484701 (1900)	1	Label, trapeze caution—Dutch
	49484801 (1900)	1	Label, trapeze caution—Swedish
	49484901 (1900)	1	Label, trapeze caution—Arabic
	494841001 (1900)	1	Label, trapeze caution—Chinese—Traditional
	494841101 (1900)	1	Label, trapeze caution—Chinese—Simplified
	494841201 (1900)	1	Label, trapeze caution—Japanese
	494841301 (1900)	1	Label, trapeze caution—Greek

International Labels—Head Section Weldment

Figure 5-61. International Labels—Head Section Weldment

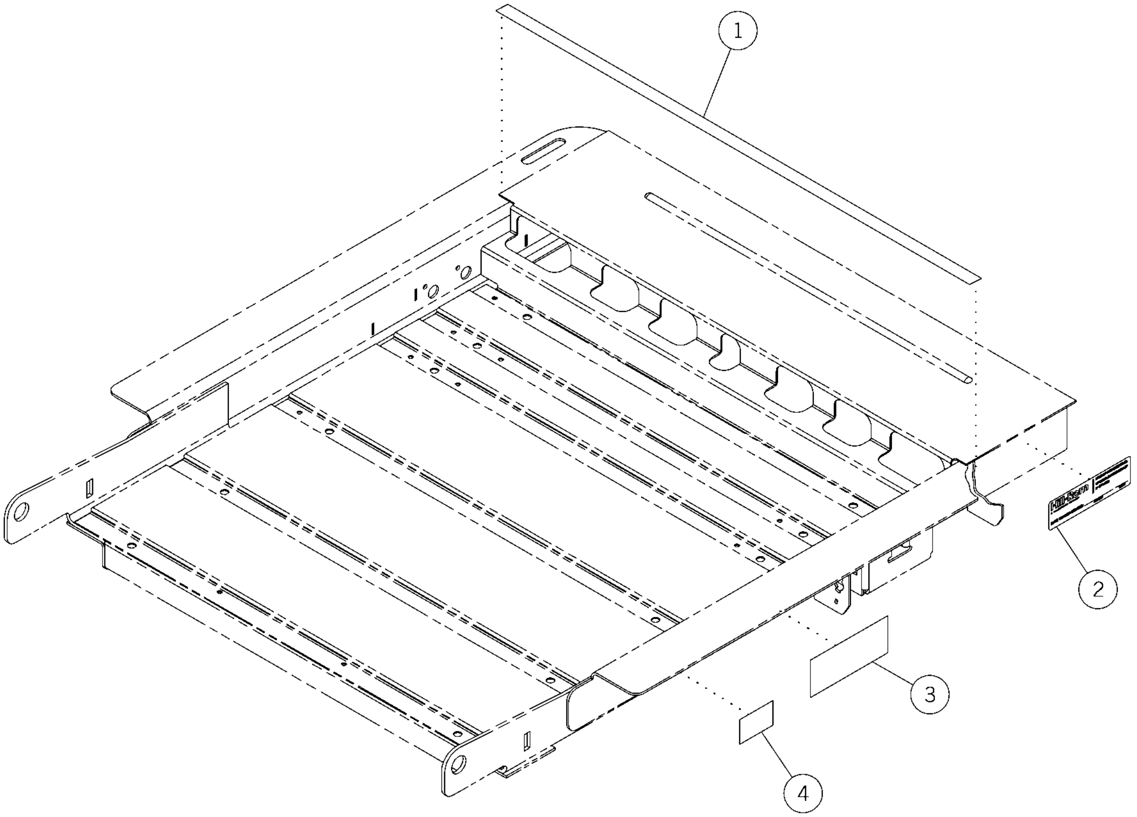

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Table 5-62. International Labels—Head Section Weldment

Item Number	Part Number	Quantity	Description
1	61068 (1900)	1	Label, bladder connection position (prevention and pulmonary surface beds only)
2	46475-05 (1900)	1	Labels (English fluoroscopy beds only)
3	70815-03 (1900)	1	Label, European Norm (EN) scale (OIML scale beds only)
4	71422 (1900)	1	Label, OIML LAT/AIT, Southern Europe (Southern European OIML scale beds only)
	71423 (1900)	1	Label, OIML LAT/AIT, Central Europe (Central European OIML scale beds only)
	71424 (1900)	1	Label, OIML LAT/AIT, Northern Europe (Northern European OIML scale beds only)

International Labels—IntelliDrive® Transport System

Figure 5-62. International Labels—IntelliDrive® Transport System

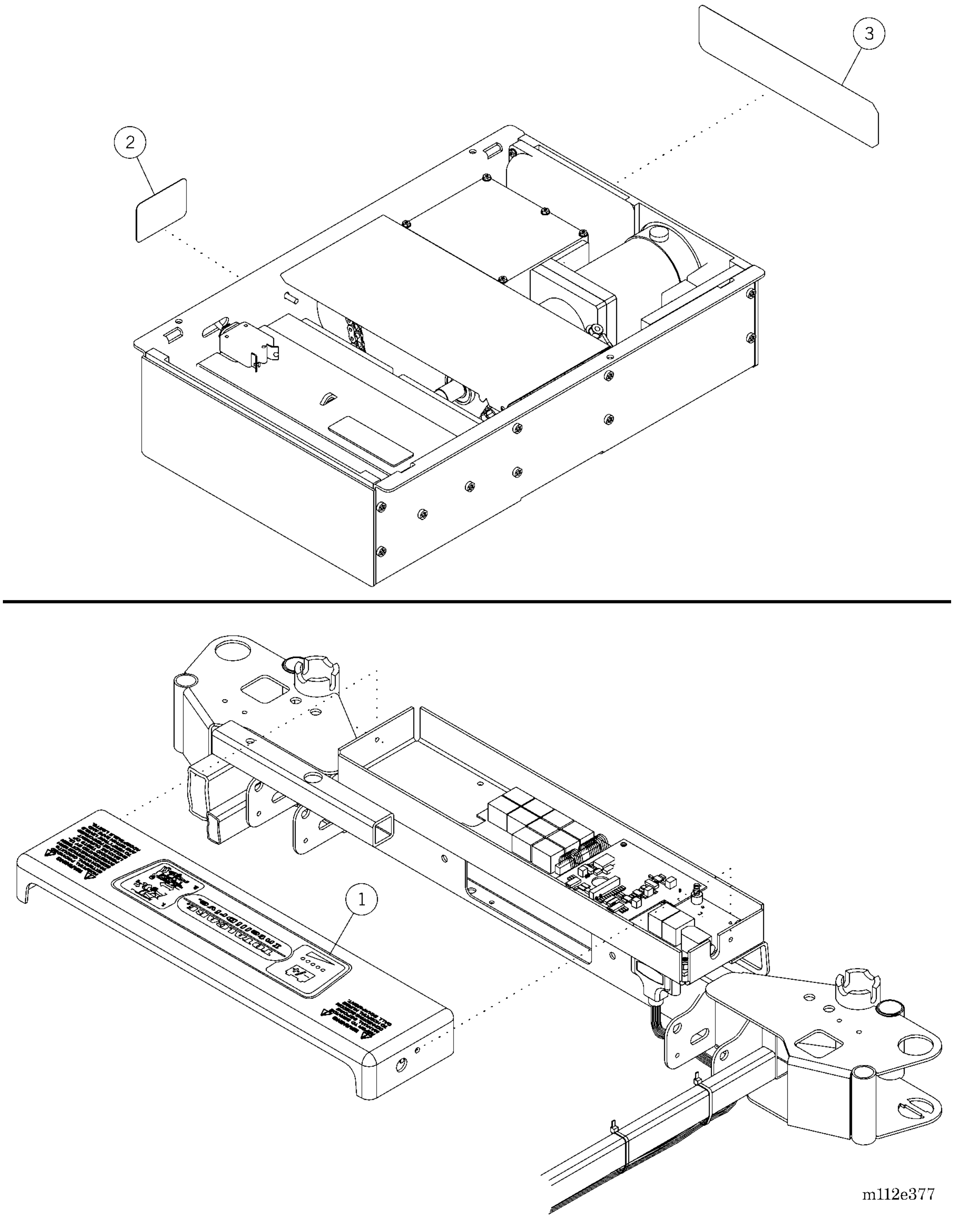

Table 5-63. International Labels—IntelliDrive® Transport System

Item Number	Part Number	Quantity	Description
1	68365101 (1900)	1	Label, battery charge—English
	68365201 (1900)	1	Label, battery charge—German
	68365301 (1900)	1	Label, battery charge—French
	68365401 (1900)	1	Label, battery charge—Spanish
	68365501 (1900)	1	Label, battery charge—Portuguese
	68365601 (1900)	1	Label, battery charge—Italian
	68365701 (1900)	1	Label, battery charge—Dutch
	68365801 (1900)	1	Label, battery charge—Swedish
	68365901 (1900)	1	Label, battery charge—Arabic
	683651001 (1900)	1	Label, battery charge—Traditional Chinese
	683651101 (1900)	1	Label, battery charge—Simplified Chinese
	683651201 (1900)	1	Label, battery charge—Japanese
	683651301 (1900)	1	Label, battery charge—Greek
2	68797101 (1900)	1	Label, on/off toggle—English
	68797201 (1900)	1	Label, on/off toggle—German
	68797301 (1900)	1	Label, on/off toggle—French
	68797401 (1900)	1	Label, on/off toggle—Spanish
	68797501 (1900)	1	Label, on/off toggle—Portuguese
	68797601 (1900)	1	Label, on/off toggle—Italian
	68797701 (1900)	1	Label, on/off toggle—Dutch
	68797801 (1900)	1	Label, on/off toggle—Swedish
	68797901 (1900)	1	Label, on/off toggle—Arabic
	687971001 (1900)	1	Label, on/off toggle—Traditional Chinese
	687971101 (1900)	1	Label, on/off toggle—Simplified Chinese
	687971201 (1900)	1	Label, on/off toggle—Japanese
	687971301 (1900)	1	Label, on/off toggle—Greek

Item Number	Part Number	Quantity	Description
3	68874101 (1900)	1	Label, IntelliDrive® Transport System override—English
	68874201 (1900)	1	Label, IntelliDrive® Transport System override—German
	68874301 (1900)	1	Label, IntelliDrive® Transport System override—French
	68874401 (1900)	1	Label, IntelliDrive® Transport System override—Spanish
	68874501 (1900)	1	Label, IntelliDrive® Transport System override—Portuguese
	68874601 (1900)	1	Label, IntelliDrive® Transport System override—Italian
	68874701 (1900)	1	Label, IntelliDrive® Transport System override—Dutch
	68874801 (1900)	1	Label, IntelliDrive® Transport System override—Swedish
	68874901 (1900)	1	Label, IntelliDrive® Transport System override—Arabic
	688741001 (1900)	1	Label, IntelliDrive® Transport System override—Chinese—Traditional
	688741101 (1900)	1	Label, IntelliDrive® Transport System override—Chinese—Simplified
	688741201 (1900)	1	Label, IntelliDrive® Transport System override—Japanese
	688741301 (1900)	1	Label, IntelliDrive® Transport System override—Greek

NOTES:

International Labels—Pulmonary Therapy Modules

Figure 5-63. International Labels—Pulmonary Therapy Modules

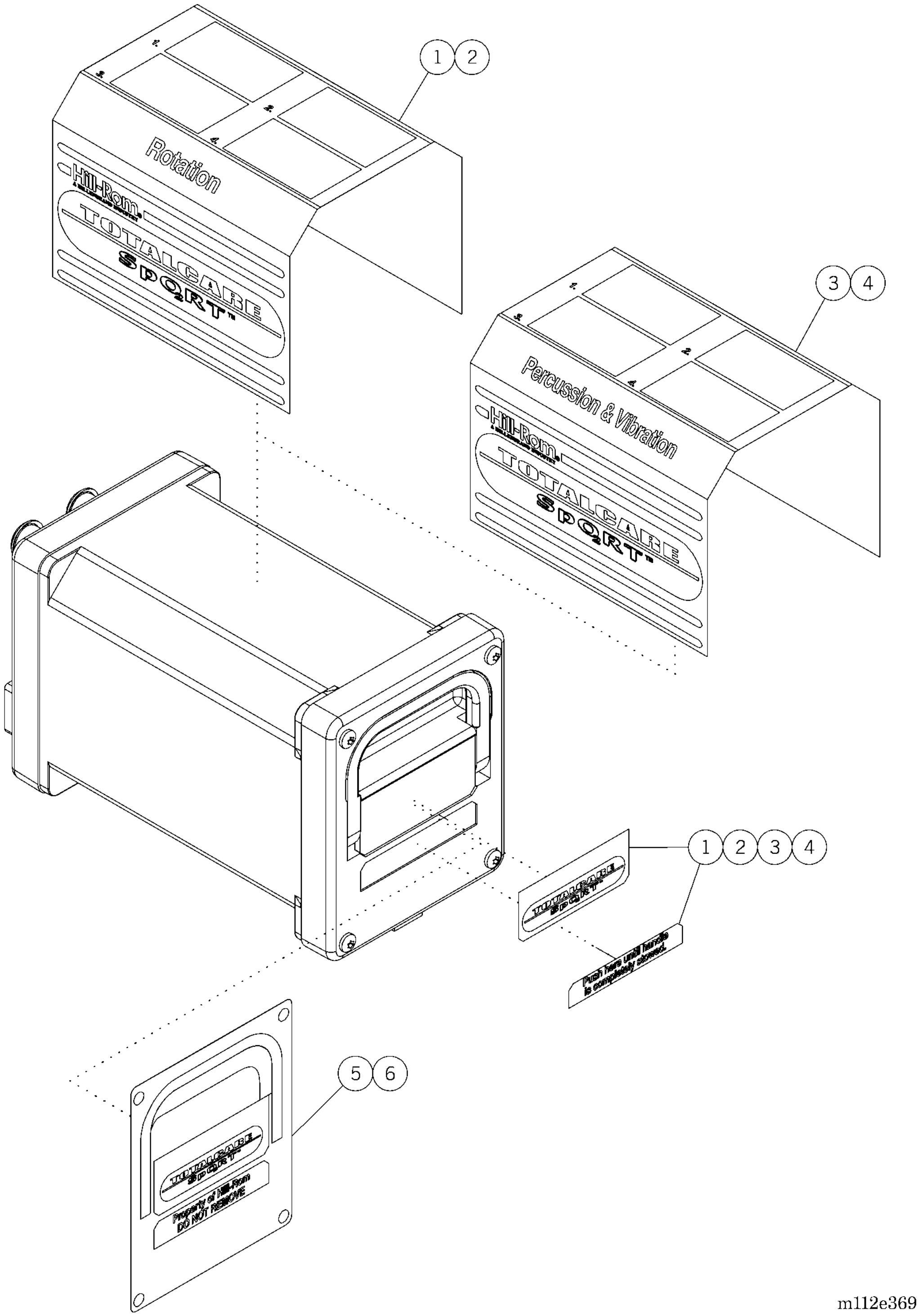
1
2
Rotation
Hill-Rom
TOTALCARE SpO2RT
3
4
Percussion & Vibration
Hill-Rom
TOTALCARE SpO2RT
1
2
3
4
TOTALCARE SpO2RT
Push here until handle is completely stowed.
5
6
TOTALCARE SpO2RT
Property of Hill-Rom DO NOT REMOVE
m112e369

Table 5-64. International Labels—Pulmonary Therapy Modules

Item Number	Part Number	Quantity	Description
1	66932101 (1900)	1	Label, rotation—English
	66932201 (1900)	1	Label, rotation—German
	66932301 (1900)	1	Label, rotation—French
	66932401 (1900)	1	Label, rotation—Spanish
	66932501 (1900)	1	Label, rotation—Portuguese
	66932601 (1900)	1	Label, rotation—Italian
	66932701 (1900)	1	Label, rotation—Dutch
	66932801 (1900)	1	Label, rotation—Swedish
	66932901 (1900)	1	Label, rotation—Arabic
	669321001 (1900)	1	Label, rotation—Chinese—Traditional
	669321101 (1900)	1	Label, rotation—Chinese—Simplified
	669321201 (1900)	1	Label, rotation—Japanese
	669321301 (1900)	1	Label, rotation—Greek
2	70030 (1900)	1	Label, pulmonary rotation (removable rental therapy modules only) (English beds only)
3	66933101 (1900)	1	Label, percussion and vibration (P/V)—English
	66933201 (1900)	1	Label, P/V—German
	66933301 (1900)	1	Label, P/V—French
	66933401 (1900)	1	Label, P/V—Spanish
	66933501 (1900)	1	Label, P/V—Portuguese
	66933601 (1900)	1	Label, P/V—Italian
	66933701 (1900)	1	Label, P/V—Dutch
	66933801 (1900)	1	Label, P/V—Swedish
	66933901 (1900)	1	Label, P/V—Arabic
	669331001 (1900)	1	Label, P/V—Chinese—Traditional
	669331101 (1900)	1	Label, P/V—Chinese—Simplified
	669331201 (1900)	1	Label, P/V—Japanese
	669331301 (1900)	1	Label, P/V—Greek

Item Number	Part Number	Quantity	Description
4	70029 (1900)	1	Label, pulmonary P/V (removable rental therapy modules only) (English beds only)
5	67756101 (1900)	1	Label, module handle—English (rental rotation therapy modules only)
	67756201 (1900)	1	Label, module handle—German (rental rotation therapy modules only)
	67756301 (1900)	1	Label, module handle—French (rental rotation therapy modules only)
	67756401 (1900)	1	Label, module handle—Spanish (rental rotation therapy modules only)
	67756501 (1900)	1	Label, module handle—Portuguese (rental rotation therapy modules only)
	67756601 (1900)	1	Label, module handle—Italian (rental rotation therapy modules only)
	67756701 (1900)	1	Label, module handle—Dutch (rental rotation therapy modules only)
	67756801 (1900)	1	Label, module handle—Swedish (rental rotation therapy modules only)
	67756901 (1900)	1	Label, module handle—Arabic (rental rotation therapy modules only)
	677561001 (1900)	1	Label, module handle—Chinese—Traditional (rental rotation therapy modules only)
	677561101 (1900)	1	Label, module handle—Simplified Chinese (rental rotation therapy modules only)
	677561201 (1900)	1	Label, module handle—Japanese (rental rotation therapy modules only)
	677561301 (1900)	1	Label, module handle—Greek (rental rotation therapy modules only)

Item Number	Part Number	Quantity	Description
6	67757101 (1900)	1	Label, module handle—English (rental P/V therapy modules only)
	67757201 (1900)	1	Label, module handle—German (rental P/V therapy modules only)
	67757301 (1900)	1	Label, module handle—French (rental P/V therapy modules only)
	67757401 (1900)	1	Label, module handle—Spanish (rental P/V therapy modules only)
	67757501 (1900)	1	Label, module handle—Portuguese (rental P/V therapy modules only)
	67757601 (1900)	1	Label, module handle—Italian (rental P/V therapy modules only)
	67757701 (1900)	1	Label, module handle—Dutch (rental P/V therapy modules only)
	67757801 (1900)	1	Label, module handle—Swedish (rental P/V therapy modules only)
	67757901 (1900)	1	Label, module handle—Arabic (rental P/V therapy modules only)
	677571001 (1900)	1	Label, module handle—Chinese—Traditional (rental P/V therapy modules only)
	677571101 (1900)	1	Label, module handle—Simplified Chinese (rental P/V therapy modules only)
	677571201 (1900)	1	Label, module handle—Japanese (rental P/V therapy modules only)
	677571301 (1900)	1	Label, module handle—Greek (rental P/V therapy modules only)

International Labels—Pulmonary Air Manifold (P1900D Model Only)

Figure 5-64. International Labels—Pulmonary Air Manifold (P1900D Model Only)

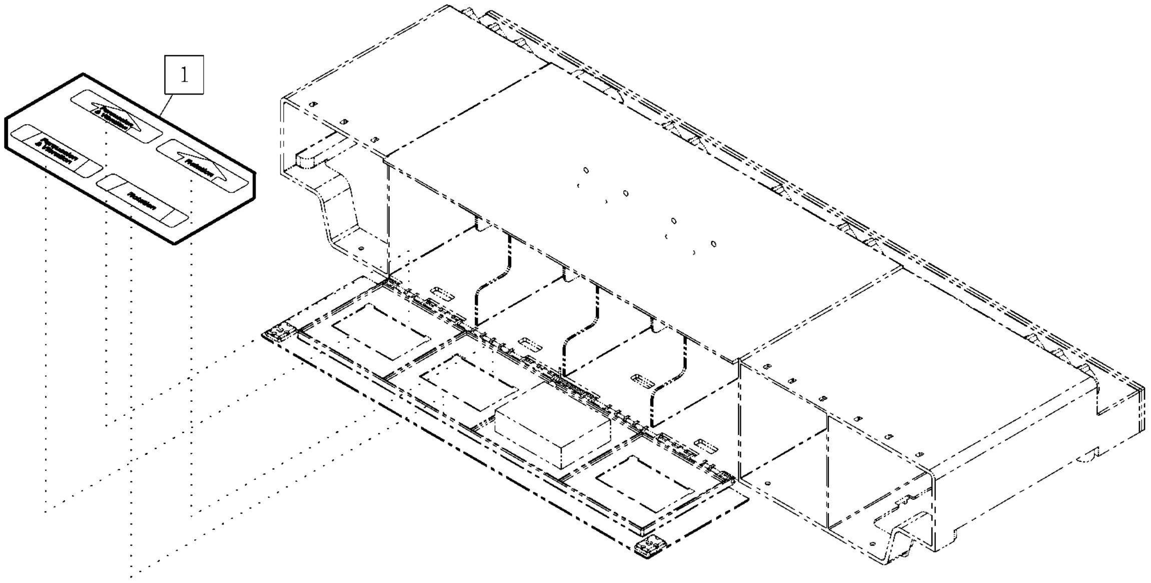

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Table 5-65. International Labels—Pulmonary Air Manifold (P1900D Model Only)

Item Number	Part Number	Quantity	Description
1	66977101 (1900)	1	Label, air manifold—English
	66977201 (1900)	1	Label, air manifold—German
	66977301 (1900)	1	Label, air manifold—French
	66977401 (1900)	1	Label, air manifold—Spanish
	66977501 (1900)	1	Label, air manifold—Portuguese
	66977601 (1900)	1	Label, air manifold—Italian
	66977701 (1900)	1	Label, air manifold—Dutch
	66977801 (1900)	1	Label, air manifold—Swedish
	66977901 (1900)	1	Label, air manifold—Arabic
	669771001 (1900)	1	Label, air manifold—Traditional Chinese
	669771101 (1900)	1	Label, air manifold—Simplified Chinese
	669771201 (1900)	1	Label, air manifold—Japanese
	669771301 (1900)	1	Label, air manifold—Greek

NOTES:

Chapter 6
General Procedures

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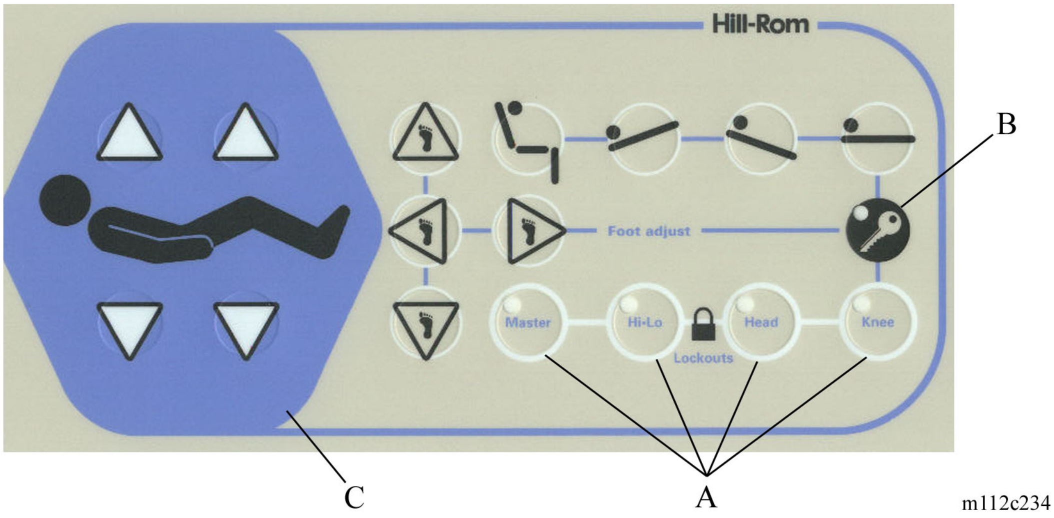
6.1 Disable Battery Operation

SHOCK HAZARD:
Unplug the bed from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.
2. To disable battery operation of the bed, perform the following:
    a. Visually check the four lockout controls (A) to see whether any are illuminated (see figure 6-1 on page 6-3). An illuminated lockout control (A) signifies that it has been locked out.

Figure 6-1. Lockout Controls



    b. If a lockout control (A) is not illuminated, then simultaneously press the **Enable key** (B) and the applicable (**Master**, **Hi-Lo**, **Head**, **Knee**) lockout control (A). The lockout will illuminate, and an audible tone sounds when a lockout is activated.
    c. Simultaneously press the Head **Up/Down** and Knee **Up/Down** controls (C) for approximately 5 seconds. The battery will be disabled when the illumination indicators on the lockout controls (A) go off.

6.2 Reset the TotalCare® Bed System

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the unit from its power source.
2. Wait 45 s.
3. Plug the unit into an appropriate power source.
4. To ensure proper operation of the TotalCare® Bed System, perform the “Function Checks” on page 2-10.

6.3 Adjust the Graphical Caregiver Interface (GCI)® Control Screen Contrast

NOTE:
It is possible to adjust the screen contrast on the Graphical Caregiver Interface (GCI)® Control down so far that you cannot see the screen.

At the Graphical Caregiver Interface (GCI)® Control, perform the following:

1. On the Graphical Caregiver Interface (GCI)® Control main menu, using the Up/Down arrows scroll to **Bed setup/Reset**.
2. Press **ENTER**.
3. Using the Up/Down arrows, scroll to **Screen contrast**.
4. Press **ENTER**.
5. An arrow will appear next to a slide bar on the left-side of the Graphical Caregiver Interface (GCI)® Control screen.
6. Using the Up/Down arrows, move the arrow up for lighter contrast, or down for darker contrast.
7. When the desired contrast is reached, press **ENTER**.

6.4 Electrical Fuse Blown—Damaged Cable/P.C. Board Combination Identification

In the event of a blown fuse, perform the following procedure to identify the damaged cable/P.C. board combination that caused the fuse to blow:

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

1. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

2. Disable the battery (refer to procedure 6.1).
3. Disconnect the signal/power cables at the Power Control Module P.C. board.
4. Disconnect all cables at the weight frame junction P.C. board.
5. Replace the damaged fuse.
6. Plug the unit into an appropriate power source.
7. Wait 30 s.
8. Check the voltage on both sides of the replaced fuse.
9. If the fuse blows again, go to step 10.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

10. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

11. Disable the battery (refer to procedure 6.1).

12. Disconnect all the cables from the Power Control Module P.C. board except for the AC cables.

13. Replace the fuse.

14. Plug the unit into an appropriate power source.

15. Wait 30 s.

16. Check the voltage on both sides of the replaced fuse.

17. If the fuse blows again, inspect the power cables, and replace as necessary.

18. After examination, if the power cables are not damaged, replace the Power Control Module P.C. board.

19. Otherwise, gradually assemble the bed to identify the damaged cable/P.C. board combination that has blown the fuse.

20. Once the damaged cable/P.C. board combination has been identified, disconnect the cable from the P.C. board.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

21. Unplug the bed from its power source.

SHOCK HAZARD:
Disable the battery. Failure to do so could result in personal injury or equipment damage.

22. Disable the battery (refer to procedure 6.1).

23. Disconnect all the cables from the Power Control Module P.C. board and weigh frame junction P.C. board except for the cable identified in step 19.

24. Replace the fuse.
25. Plug the unit into an appropriate power source.
26. Wait 30 s.
27. Check the voltage on both sides of the replaced fuse to determine whether the cable or the P.C. board is damaged.
28. Replace the damaged cable or P.C. board.
29. To ensure proper operation of the TotalCare® Bed System, perform the "Function Checks" on page 2-10.

6.5 Bleed the Hydraulic System

Tools required: None

Bleed the hydraulic system as follows:

1. Press the **Head up** control, and hold until the section reaches its mechanical limit.
2. While holding the **Head up** control, simultaneously press down on the CPR foot pedal.

⚠ **CAUTION:**
Care should be taken when pressing the CPR foot pedal. The head section drops down. Equipment damage could occur.

This will force the hydraulic fluid/air from the hydraulic lines back into the hydraulic tank.

3. Do this a couple of times to remove all the air.

6.6 Verify Operation of the NAWI Class IIII Scale (NAWI Class IIII Scale—European Version Only)

Tools required:	T25 Torx®[1] screwdriver
	Calculator
	White gloves with rubber facing
	Window cleaner
	Clean, non-abrasive cloth
	Pen or pencil
	Antistatic strap
	Thin blade screwdriver
	Voltmeter
	Megameter
	Marked zone board with a maximum weight of 10 kg
	Dummy plug (P/N 3069801)
	Weight set, 200 kg, **Class M1** or better

The weight set, 200 kg, should include the following:
Ten 50 g weights
One 500 g weight
Four 5 kg weights
Four 1 kg weights
One 200 g weight
Twenty 10 kg weights

NOTE:
Cast iron or stainless steel weights may be used for this verification, as long as they meet the **Class M1** requirements.

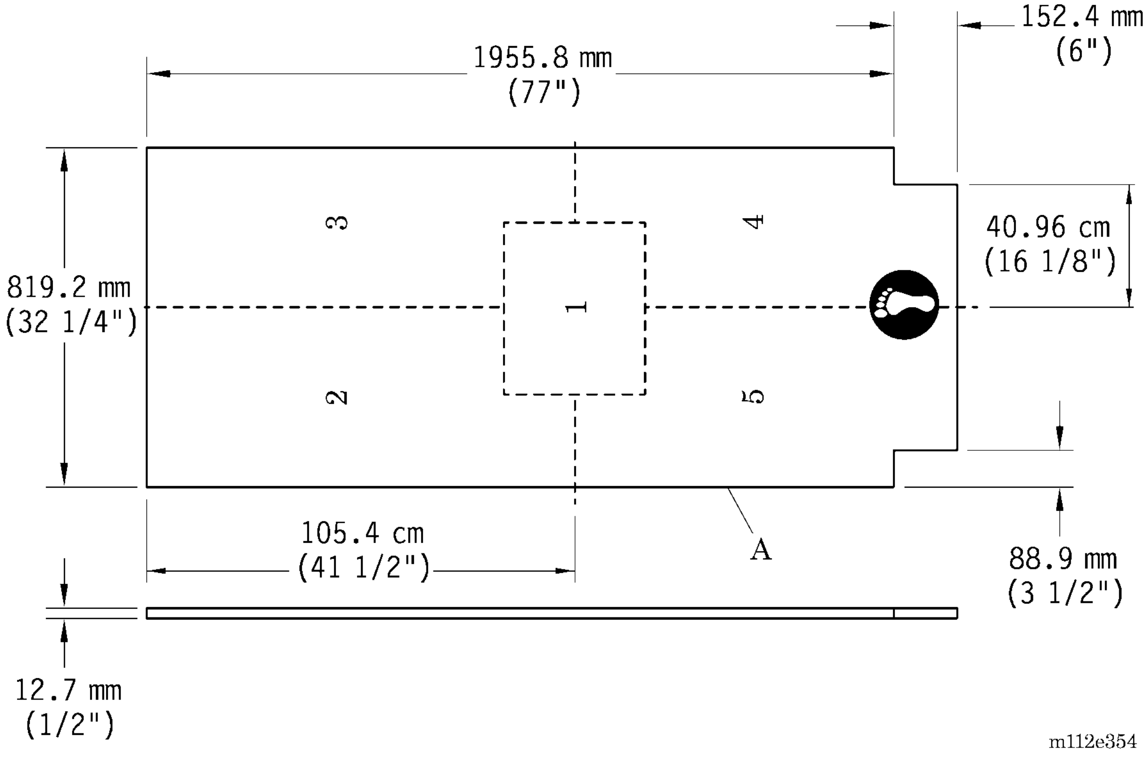
---

[1] Torx® is a registered trademark of Textron, Inc.

Marked Zone Board

1. Ensure that the marked zone board (A) meets the following dimensions (see figure 6-2 on page 6-11):

Figure 6-2. Zone Board Dimensions


1955.8 mm
(77")
152.4 mm
(6")
819.2 mm
(32 1/4")
3
4
1
2
5
40.96 cm
(16 1/8")
105.4 cm
(41 1/2")
A
88.9 mm
(3 1/2")
12.7 mm
(1/2")
m112e354

2. If necessary, perform the following:
   a. Divide the marked zone board (A) into four equal quadrants.
   b. Starting at the head left quadrant and working clockwise through the quadrants, mark the quadrants as Zones **2** through **5**.
   c. Mark the area where the four quadrants meet in the center board as Zone **1**.

Setup

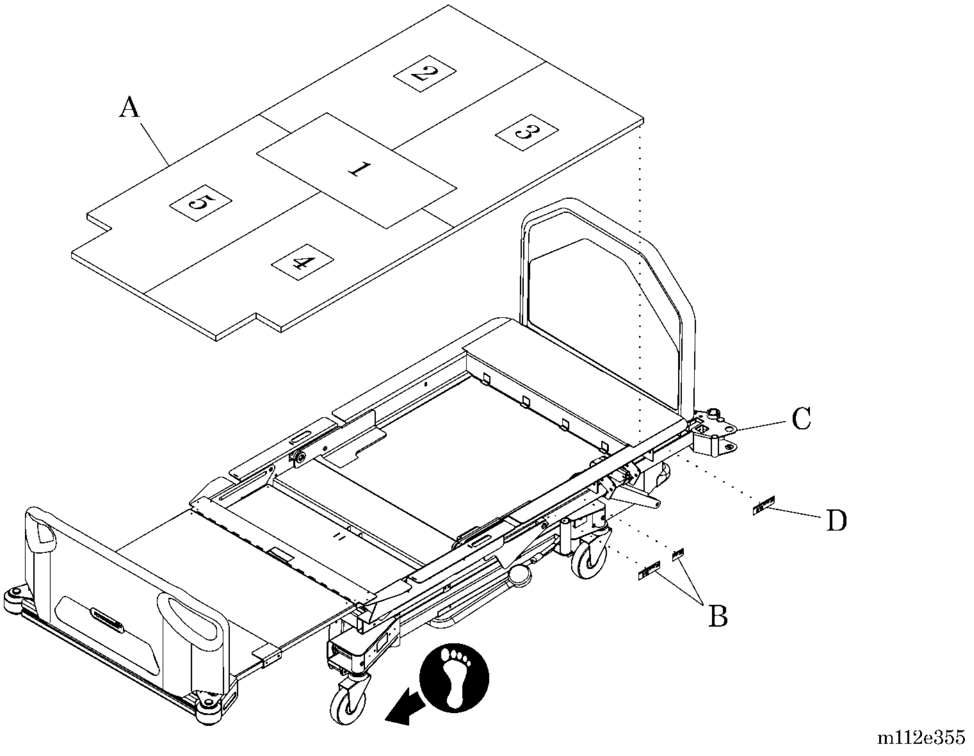
1. Ensure that the weight set is within current calibration:
   - If any weights are dropped or otherwise appear damaged, replace them.
   - If skin contacts a weight, or if dirt is visible on a weight, wipe down the weight with window cleaner and a clean, non-abrasive cloth between calibrations.
2. Ensure that the bed is on a flat, stable surface.
3. Set the brakes.
4. Remove the mattress from the bed.
5. If the bed has an air system installed, perform the following:
   a. Disconnect the MTS cable (P8) from the weigh frame junction P.C. board.
   b. Install the dummy plug on the weigh frame junction P.C. board.
6. Plug the bed into an appropriate power source.
7. If the bed has an air system installed, perform the following:
   a. At the Graphical Caregiver Interface (GCI)® Control, access the **Service** screen.
   b. Send a **10 166** diagnostic code to disable the air system.
8. Raise the bed to its highest position.
9. Fully extend the foot section, and ensure that the sleep deck is **flat**.
10. Ensure that no external weights are on the bed and no outside weight interferences exist:
    - Ensure that no accessories are installed on the bed.
    - Ensure that the pulmonary therapy modules are removed.

11. On the “NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)” on page 6-27, record the following information:

- Bed model number
- Serial number
- Upgrade kit serial number
- Current date
- Inspector number
- Current time
- Current temperature
- Current humidity

12. Install the altitude and latitude and green **M** labels (B) on the bed (C) at the foot end side of the siderail latch (see figure 6-3 on page 6-13).

Figure 6-3. Label Installation and Zone Board Placement



13. Install the kit serial number upgrade label (D) next to the bed serial number label.

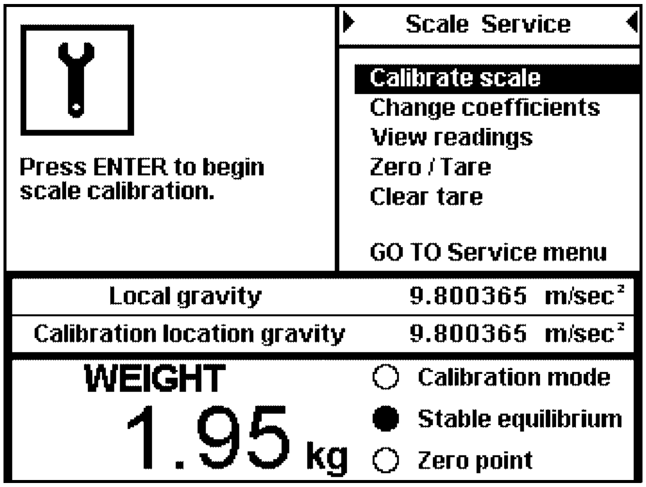
14. Place the marked zone board (A) on the bed (C).

Verification of the NAWI Class IIII Scale

Gravitational Constant

1. At the Graphical Caregiver Interface (GCI)® Control, access the **Service Screen** by pressing the Up and Down arrow buttons simultaneously for 15 seconds.
2. At the **Service Screen**, select **Scale Service**, and press **Enter**. The **Scale Service** screen appears (see figure 6-4 on page 6-14).

Figure 6-4. Scale Service Screen



Press ENTER to begin scale calibration.

Local gravity 9.800365 m/sec^2

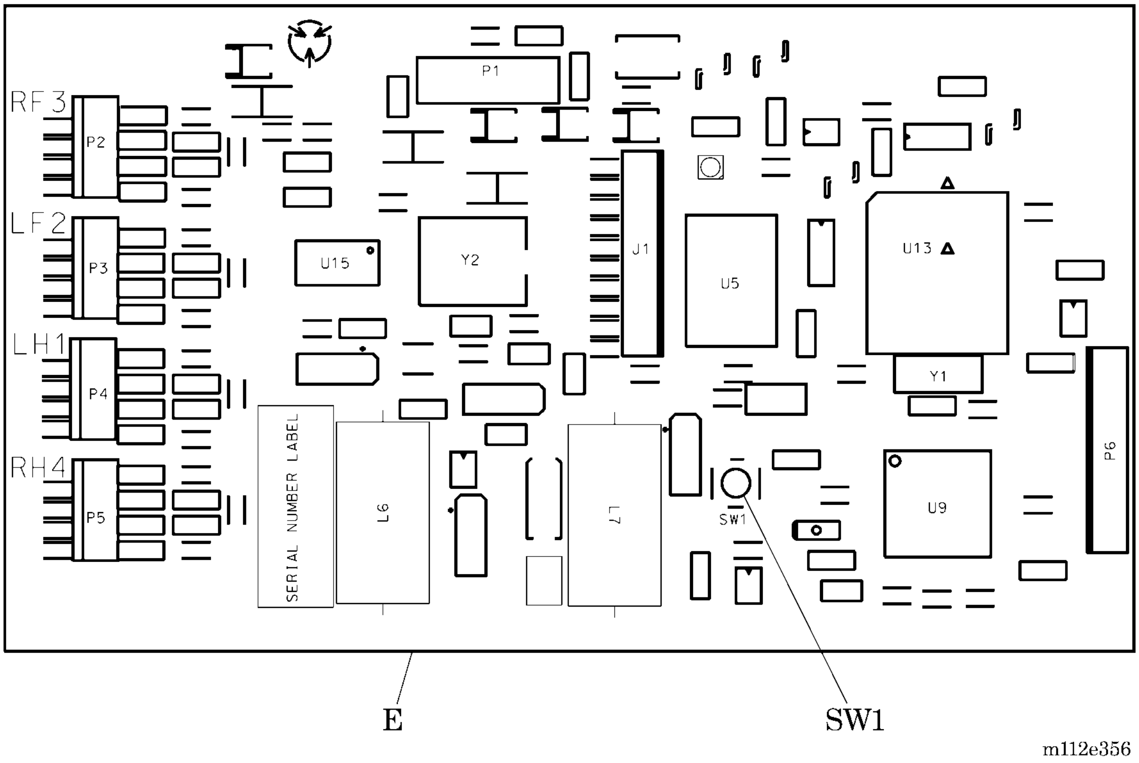
Calibration location gravity 9.800365 m/sec^2

WEIGHT 1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

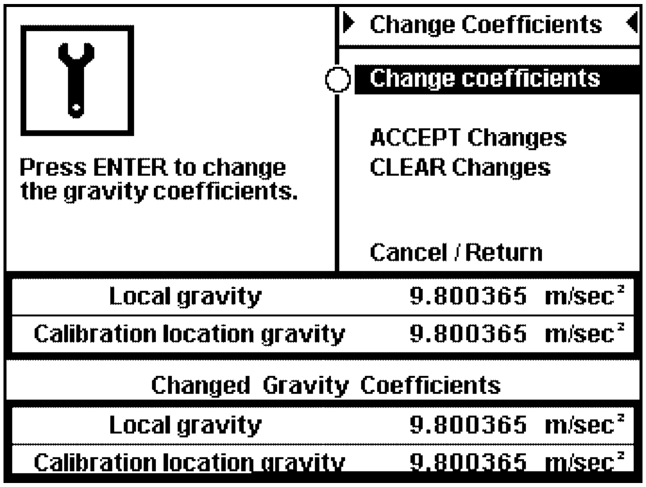
3. At the **Scale Service** screen, verify that the **Calibration mode** indicator is illuminated. If the **Calibration mode** indicator is **not** illuminated, press the calibration button (SW1) on the scale P.C. board (E) to activate it (see figure 6-5 on page 6-15).

Figure 6-5. Scale P.C. Board


RF3
P2
LF2
P3
LH1
P4
RH4
P5
SERIAL NUMBER LABEL
U15
Y2
P1
L6
L7
J1
U5
U13
Y1
U9
P6
SW1
E
SW1
m112e356

4. At the **Scale Service** screen, select **Change Coefficients**, and press **Enter**. The **Change Coefficients** screen appears (see figure 6-6 on page 6-15).

Figure 6-6. Change Coefficients Screen



Change Coefficients

○ Change coefficients

ACCEPT Changes
CLEAR Changes

Cancel / Return

Press ENTER to change the gravity coefficients.

Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

Changed Gravity Coefficients

Local gravity	9.800365 m/sec²
Calibration location gravity	9.800365 m/sec²

5. Verify that the **Calibration location gravity** reading is correct for the location of the unit (see table 6-1 on page 6-16).

Table 6-1. Calibration Location Gravities

Northern Europe Gravity: 9.8176	Central Europe Gravity: 9.808	Southern Europe Gravity: 9.8033
Finland	Belgium	Austria
Iceland	Czech Republic	Bulgaria
Norway	Denmark	France
Sweden	Germany	Greece
	Ireland	Hungary
	Latvia	Italy
	Lithuania	Portugal
	Luxembourg	Romania
	Netherlands	Slovakia
	Poland	Slovenia
	United Kingdom	Spain
		Switzerland

6. If the **Calibration location gravity** reading is **not** correct, refer to the on-screen menu, and enter the correct gravity constant for the **Local gravity** reading. To select each digit, press **Enter** to move the cursor from digit to digit.

Calibration

CAUTION:
Use only white cloth gloves with rubber facing when handling the stainless steel weights. Failure to do so could result in equipment damage.

1. Put on white cloth gloves with rubber facing.

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

2. **Gently** place 200 kg of weight on the center of the marked zone board (A) (see figure 6-3 on page 6-13).

3. Wait 30 seconds, and then remove the weight from the marked zone board (A).

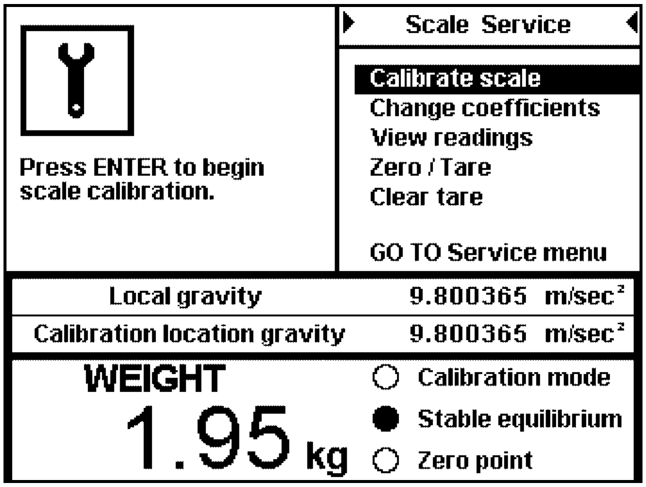
CAUTION:
When handling electronic components, wear an antistatic strap. Failure to do so could result in component damage.

4. Put on the antistatic strap, and attach it to a ground strap on the bed.

5. At the Graphical Caregiver Interface (GCI)® Control, access the **Service Screen** by pressing the Up and Down arrow buttons simultaneously for 15 seconds.

6. At the **Service Screen**, select **Scale Service**, and press **Enter**. The **Scale Service** screen appears (see figure 6-7 on page 6-17).

Figure 6-7. Scale Service Screen



Press ENTER to begin scale calibration.

Local gravity 9.800365 m/sec²
Calibration location gravity 9.800365 m/sec²

WEIGHT
1.95 kg

○ Calibration mode
● Stable equilibrium
○ Zero point

7. At the scale P.C. board (E), press the calibration switch (SW1) for 10 seconds until it beeps twice (see figure 6-5 on page 6-15). Ensure that the **Calibration Mode** indicator is illuminated.

8. At the **Scale Service** screen, select **Calibrate Scale**, and press **Enter**. Ensure that the siderails are in the **lower** position, and follow the on-screen instructions:
   - Ensure that there is **no** movement on the bed. To minimize movement of the bed during calibration, keep the Graphical Caregiver Interface (GCI)® control **down**.
   - If movement occurs on the bed, repeat step 8.

⚠ **CAUTION:**
To avoid equipment damage, place the weights **gently** onto the marked zone board.

9. When directed by the on-screen instructions, **gently** center 100 kg of weight on the four quadrants of the marked zone board (A) (see figure 6-3 on page 6-13).
10. Unplug the bed from its power source.
11. When the relay on the PCM P.C. board clicks, plug the unit into an appropriate power source.
12. Remove the weight from the marked zone board (A).

Repeatability

1. At the Graphical Caregiver Interface (GCI)® Control, place the bed in **Service Mode**, and select **View Readings**. The **View Readings** screen appears.
2. Record the indication unloaded as $\mathbf{I_0}$ on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-2 on page 6-27).

⚠ **CAUTION:**
To avoid equipment damage, place the weights **gently** onto the marked zone board.

3. **Gently** center 100 kg of weight on the marked zone board (A) (see figure 6-3 on page 6-13).

4. Record the indication of load **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-2 on page 6-27).

5. Remove the weight from the marked zone board (A).

6. Calculate $\mathbf{P = I - I_0}$, and record in the appropriate row on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-2 on page 6-27).

7. Repeat step 1 through step 6 two more times.

8. Subtract the smallest **P** value from the largest **P** value, and record the result in the $\mathbf{P_{MAX} - P_{MIN}}$ row on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-2 on page 6-27).

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

9. **Gently** replace the 100 kg load with a 200 kg load, and repeat step 2 through step 8.

10. If the $\mathbf{P_{MAX} - P_{MIN}}$ value for both the 100 kg load and the 200 kg load is less than or equal to the **MPE** value, mark the **Pass** box on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-2 on page 6-27). Otherwise, mark the **Fail** box, and go to “Function Checks” on page 2-10 to troubleshoot the unit.

Discrimination

1. Perform the following to place the display in **Caregiver Mode**:
    a. Unplug the bed from its power source.
    b. Plug the bed into an appropriate power source.
    c. At the Graphical Caregiver Interface (GCI)® Control, scroll to **Scale Functions**, and press **Enter**.

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

2. **Gently** place 5 kg of weight on the marked zone board (A), and then **gently** add ten additional weights of 50 g each on the marked zone board (A) (see figure 6-3 on page 6-13).

3. Record the scale reading in the $\mathbf{I_1}$ column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-3 on page 6-28).

4. Remove one 50 g weight at a time until the scale reading reduces by 0.5 kg and the display movement stabilizes.

5. Record the weight removed as $\Delta\mathbf{L}$ on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-3 on page 6-28).

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

6. **Gently** place one 50 g weight on the marked zone board (A), and then **gently** add 700 g of weight on the marked zone board (A).

7. Record the scale reading as $\mathbf{I_2}$ in the appropriate row on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-3 on page 6-28).

8. Calculate $\mathbf{I_2 - I_1}$, and record the result on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-3 on page 6-28).

9. Unload the scale, and then repeat step 1 through step 8 two more times, replacing the 5 kg load with a 100 kg load and then a 200 kg load.

10. If all three rows of $\mathbf{I_2 - I_1}$ values equal **0.5 kg**, mark the **Pass** column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-3 on page 6-28). Otherwise, mark the **Fail** column, and go to “Function Checks” on page 2-10 to troubleshoot the unit.

11. Remove all weights from the marked zone board (A).

Accuracy of Tare Device

1. Ensure that the display is in **Caregiver Mode**.

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

2. **Gently** place 25 kg of weight on the bed.
3. Record the pre-tare scale indication on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-4 on page 6-28).
4. Tare the scale, and record the new scale reading on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-4 on page 6-28).

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

5. **Gently** add 50 g of weight until the display changes by **0.5 kg**.
6. Record the amount of weight added in the **ΔL** column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-4 on page 6-28).
7. Calculate **E = 250 g - ΔL**, and record the results on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-4 on page 6-28).
8. If the calculated value of **E** is less than or equal to the **MPE** value, then mark the **Pass** column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-4 on page 6-28). Otherwise, mark the **Fail** column, and go to “Function Checks” on page 2-10 to troubleshoot the unit.
9. Remove all weights from the marked zone board (A), and undo the tare (see figure 6-3 on page 6-13).

Eccentricity

1. Ensure that no load exists on the marked zone board (A).

2. At the Graphical Caregiver Interface (GCI)® Control, access the **View Readings** screen, and record the indication unloaded as $\mathbf{I_0}$ on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-5 on page 6-28).

3. Calculate the error, $\mathbf{E_0}$.

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

4. **Gently** center 70 kg of weight in Zone 2 of the marked zone board (A) (see figure 6-3 on page 6-13).

5. Record the scale reading as **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-5 on page 6-28), and then calculate the error, **E**, and the corrected error, $\mathbf{E_C}$.

6. Repeat step 1 through step 5 for Zones 3 through 5 on the marked zone board (A) (see figure 6-3 on page 6-13).

NOTE:
It is **not** necessary to check Zone 1 of the marked zone board.

7. Compare all values of $\mathbf{E_C}$ to the corresponding **MPE** value. If all $\mathbf{E_C}$ values are less than or equal to the **MPE** value, mark the **Pass** column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-5 on page 6-28). Otherwise, mark the **Fail** column, and go to “Function Checks” on page 2-10 to troubleshoot the unit.

8. Remove the weight from the marked zone board (A) (see figure 6-3 on page 6-13).

Tare (Weighing Test)

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

1. **Gently** place 20 kg of weight on the marked zone board (A), and then record the scale reading as **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-6 on page 6-29).
2. Perform the following to tare the scale from the **View Readings** screen:
    a. Press the **Cancel/Return** button to back up one menu level.
    b. Select **Tare**, and follow the on-screen instructions.
    c. Return to the **View Readings** screen.
3. Referring to the **Load** column in table 6-6 on page 6-29, start with the tared load of **0**, and perform the following:
    a. **Gently** place the weight listed in the **Interval Weights** column on the marked zone board (A), and record the scale reading on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-6 on page 6-29) (see figure 6-3 on page 6-13).
    b. One row at a time, increase the weight load, and then record the scale reading on the form.
    c. After 180 kg of weight is reached, begin removing weight in the intervals listed, one row at a time, and record the scale readings on the form.
4. Calculate the error, **E = I - L**.
5. Calculate the corrected error, $\mathbf{E_C = E - E_0}$, with $\mathbf{E_0}$ the error calculated at a load of **0**.
6. Remove 20 kg of weight from the marked zone board (A) (see figure 6-3 on page 6-13).
7. With no load on the marked zone board (A), tare the scale again.
8. **Gently** place 50 kg of weight on the marked zone board (A).

9. Record the scale reading as **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-7 on page 6-29), and then tare the scale again.

10. Return to the **View Readings** screen.

11. Referring to the **Load** column in table 6-7 on page 6-29, start with the tared load of **0**, and perform the following:
    a. **Gently** place the weight listed in the **Load** column on the marked zone board (A), and record the scale reading as **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-7 on page 6-29) (see figure 6-3 on page 6-13).
    b. One row at a time, increase the weight load, and then record the scale reading on the form.
    c. After 150 kg of weight is reached, begin removing weight in the intervals listed, one row at a time, and record the scale readings on the form.

12. Repeat step 1 through step 11.

13. Calculate the error, **E = I - L**, for each row, and then record the results on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-7 on page 6-29).

14. Compare all values of $\mathbf{E_C}$ to the corresponding **MPE** value. If all $\mathbf{E_C}$ values are less than or equal to the **MPE** value, mark the **Pass** column on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-7 on page 6-29). Otherwise, mark the **Fail** column, and go to “Function Checks” on page 2-10 to troubleshoot the unit.

15. Remove all weight from the marked zone board (A) (see figure 6-3 on page 6-13).

16. Tare the scale again, and select the **View Readings** menu.

Errors of Indication (Weighing Performance)

1. If necessary, access the **View Readings** screen.

CAUTION:
To avoid equipment damage, place the weights **gently** onto the marked zone board.

2. Referring to the **Load** column in table 6-8 on page 6-30, start with the tared load of **0**, and perform the following:
    a. **Gently** place the weight listed in the **Interval Weights** column on the marked zone board (A), and record the scale reading as **I** on the *NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)* (see table 6-8 on page 6-30).
    b. One row at a time, increase the weight load, and then record the scale reading on the form.
    c. After 200 kg of weight is reached, begin removing weight in the intervals listed, one row at a time, and record the scale readings on the form.
3. For each row, subtract the load value from the scale reading, and record the value in the **E = Scale Reading - Load** column on the “NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)” on page 6-27.
4. Subtract the error calculated at zero, $\mathbf{E_0}$, from the error, **E**, to calculate the corrected error, $\mathbf{E_C}$, and record the results on the form.
5. Compare all values of $\mathbf{E_C}$ to the corresponding **MPE** value. If all $\mathbf{E_C}$ values are less than or equal to the **MPE** value, mark the **Pass** column on the “NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)” on page 6-27. Otherwise, mark the **Fail** column, and go to “Function Checks” on page 2-10 to troubleshoot the unit.

Sealing, Stamping, and Marking

1. If the scale passes all tests, ensuring correct functioning of all devices and proper construction, mark the **Sealing, Stamping, and Markings** and **Conformity** boxes as **Pass** on the “NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)” on page 6-27. Otherwise, mark the **Conformity** box as **Fail**, and contact Hill-Rom Technical Support at (800) 445-3720.
2. Install the two mounting screws to secure the scale P.C. board cover.

3. Place the seal labels over each mounting screw.
4. Install the base frame covers.

Declaration of Conformity, Signature of Observer, and Release for Distribution

1. After all prior steps are completed and passed, sign the "NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)" on page 6-27.
2. Save the completed "NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)" on page 6-27, and return it to:

HILL-ROM COMPANY, INC.
1069 STATE ROUTE 46 EAST
BATESVILLE, IN 47006-9167

ATTN: QUALITY ASSURANCE (MAIL CODE P58)

NAWI Class IIII Scale EC Verification Report Form (NAWI Class IIII Scale—European Version Only)

Model #	**Date**
Serial #	**Inspector #**
Upgrade Kit Serial #	**Time**
Temperature	**Humidity**
Visual Inspection (Requirement 8.3.2)	
☐ **Pass**	☐ **Fail**

Table 6-2. Repeatability (Requirement 3.6.1, Test A.4.10)

Load of ½MAX = 100 kg				**Load of MAX = 200 kg**			
	Indication of zero (I_0)	**Scale Reading/ Indication (I)**	**$P = I - I_0$**		**Indication of zero (I_0)**	**Scale Reading/ Indication (I)**	**$P = I - I_0$**
1				**4**			
2				**5**			
3				**6**			
$P_{MAX} - P_{MIN} =$				**$P_{MAX} - P_{MIN} =$**			
MPE **0.5 kg**				**MPE** **0.75 kg**			

PASS ($P_{MAX} - P_{MIN}$ for either test ≤ MPE)	
FAIL ($P_{MAX} - P_{MIN}$ for either test > MPE)	

Table 6-3. Discrimination (Requirement 3.8, Test A.4.8)

Load (L)	**Indication (I_1)**	**Removed Load (ΔL)**	**Added 1/10d**	**Extra Load 1.4d**	**Indication (I_2)**	**I_2 - I_1**
5.5 kg			50 g	700 g		
100.5 kg			50 g	700 g		
200.5 kg			50 g	700 g		

PASS (I_2 - I_1 equals d for each load)	
FAIL (I_2 - I_1 does **not** equal d for each load)	

Table 6-4. Accuracy of Tare Device (Requirement 4.7.3, Test 4.6.2)

Load (L)	**Pre-Tare Indication**	**Scale Reading/ Indication (I)**	**ΔL**	**Error ($E = 250$ g - ΔL)**	**MPE**
25 kg					125 kg

PASS ($E \leq$ MPE)	
FAIL ($E >$ MPE)	

Table 6-5. Eccentricity (Requirement 3.6.2, Test A.4.7)

Zone	**Load (L)**	**Scale Reading/ Indication (I)**	**Error ($E = I - L$)**	**Corrected Error ($E_C = E - E_0$, with E_0 = Error calculated at 0)**	**MPE**
1	0		E_0	■	0.25 kg
	70 kg				0.5 kg
2	70 kg				0.5 kg
3	70 kg				0.5 kg
4	70 kg				0.5 kg
5	70 kg				0.5 kg

PASS ($E_C \leq$ MPE)	
FAIL ($E_C >$ MPE)	

Table 6-6. Tare (Weighing Test)—First Tare Load at 20 kg (Requirements 3.5.3.3 and 3.5.3.4, Tests A.4.6.1 and A.4.6.3)

Load (L)	**Indication of 20 kg before tare:**			**MPE**
	Scale Reading/ Indication (I)	**Error (E = I - L)**	**Corrected Error ($E_C = E - E_0$, with E_0 = Error calculated at 0)**	
0 kg		E_0	■	0.25 kg
5 kg				0.25 kg
25 kg				0.25 kg
100 kg				0.5 kg
180 kg				0.75 kg
100 kg				0.5 kg
25 kg				0.25 kg
5 kg				0.25 kg
0 kg				0.25 kg

Table 6-7. Tare (Weighing Test)—Second Tare Load at 50 kg (Requirements 3.5.3.3 and 3.5.3.4, Tests A.4.6.1 and A.4.6.3)

Load (L)	**Indication of 50 kg before tare:**			**MPE**
	Scale Reading/ Indication (I)	**Error (E = I - L)**	**Corrected Error ($E_C = E - E_0$, with E_0 = Error calculated at 0)**	
0 kg		E_0	■	0.25 kg
5 kg				0.25 kg
25 kg				0.25 kg
100 kg				0.5 kg
180 kg				0.75 kg
100 kg				0.5 kg
25 kg				0.25 kg
5 kg				0.25 kg
0 kg				0.25 kg
			PASS ($E_C \leq$ MPE)	
			FAIL ($E_C >$ MPE)	

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Table 6-8. Errors of Indication (Weighing Performance Test) (Requirements 3.5.1, 3.5.3, and 3.5.3.4, Tests A.4.4 to A.4.6)

Load (L)	**Indication of 50 kg before tare:**			**MPE**
	Scale Reading/ Indication (I)	**Error (E = I - L)**	**Corrected Error ($E_C = E - E_0$, with E_0 = Error calculated at 0)**	
0 kg		E_0		0.25 kg
5 kg				0.25 kg
25 kg				0.25 kg
100 kg				0.5 kg
180 kg				0.75 kg
100 kg				0.5 kg
25 kg				0.25 kg
5 kg				0.25 kg
0 kg				0.25 kg
			PASS ($E_C \leq$ MPE)	
			FAIL ($E_C >$ MPE)	

Sealing, Stamping, and Markings:

☐ **Pass** ☐ **Fail**

Conformity (Requirement 8.3.1 and EC-type approval):

☐ **Pass** ☐ **Fail**

Signature of Observer

Cleaning and Care

WARNING:
Follow the product manufacturer’s instructions. Failure to do so could result in personal injury or equipment damage.

SHOCK HAZARD:
Unplug the unit from its power source. Failure to do so could result in personal injury or equipment damage.

SHOCK HAZARD:
Do not expose the unit to excessive moisture that would allow for liquid pooling. Personal injury or equipment damage could occur.

CAUTION:
Do not use harsh cleaners/detergents such as scouring pads or heavy duty grease removers or solvents such as acetone. Equipment damage could occur.

SHOCK HAZARD:
Take care to prevent shearing or pinching of power cords. An electrical shock hazard exists. Failure to do so could result in personal injury or equipment damage.

General Cleaning

Clean the unit with a lightly dampened cloth and any ordinary cleaner/disinfectant. Do not use excessive liquid.

1. To clean directly beneath the sleep surface at the head end of the bed, lift the head end of the mattress secured by magnets.
2. To clean directly beneath the sleep surface at the foot end of the bed, lift the foot end of the mattress secured by magnets.
3. To remove the sleep surface, (see “Short Stay Surface” on page 4-206) or (see “Treatment Sleep Surface and Pulmonary Sleep Surface” on page 4-210).

Steam Cleaning

Do not use any steam cleaning device on the TotalCare® Bed System. Excessive moisture can damage mechanisms in this unit.

Cleaning Hard to Clean Spots

Always unplug the bed system before cleaning up fluid spills.

To remove difficult spots or stains, use standard household cleaners and a soft bristle brush. To loosen heavy, dried-on soil or excreta, you may first need to saturate the spot.

Some fluids used in the hospital environment, such as zinc oxide creams, if allowed to remain on the surface, will cause a permanent stain. Wipe up fluid spills as soon as possible.

Cleaning Blood and Excreta

If possible, wipe up excess blood and excreta when wet, because the cleaning process is more difficult after these substances dry and cake on the surface.

Clean blood and excreta from the surface by wiping vigorously with a lightly dampened sponge or rag using an EPA-registered (USA only), intermediate-level (tuberculocidal), cleaner/disinfectant.

Following Standard Precautions, rinse the rag or sponge periodically, after wiping, until the rag or sponge shows no evidence of the substance being cleaned. Rinsing may be required several times for puddled and dried blood.

Finally, wipe with a fresh disinfecting solution and a clean rag or sponge. Allow the ticking to air dry.

Disinfecting

Dilute and use disinfectants and germicides as specified on the manufacturer's label.

Surface Damage

Tears, holes, and cracks in the sleep surface ticking will compromise surface impermeability and resistance to cross infection. Repairs are not recommended.

Moisture Control

All patient surfaces control the moisture content of the air within the ticking by providing greater potential for moisture vapor transfer from the inside to the outside in the non-patient contact area than from the outside to the inside in the patient contact area.

Incontinence Protection

Protect the sleep surface mattress from incontinence as follows:

1. Cover patient surfaces with a fitted, knit, bottom sheet.

2. Loosely place a woven draw sheet centered under the pelvis extending from about the knees to the neck.

3. Center only one Hill-Rom-approved absorbent reusable or disposable incontinence pad in the buttocks region where you would expect excreta to drain. The pad should extend from the iliac crest to slightly above the knees.

   NOTE:
   Use Hill-Rom-approved absorbent materials, such as a reusable or disposable incontinence pad, size 34" x 36" (86 cm x 91 cm), or equivalent (such as Geri-Care®[1] Super Ibex®[2] reusable or Professional Medical Kenguard®[3] disposable incontinence pad).

Linen Care

Knitted and fitted sheets are suggested for use with the sleep surface mattress. Knitted sheets allow stretching of the fabric material for installation, and fitted sheets with proper sizing are important to ensure good retention.

Best retention occurs when the fitted sheet extends 2" (5 cm) or more under the corners of the sleep surface encasement cover. Magnets inside of the ticking material and on the underside of the sleep surface assist in the retention of additional sheets and blankets. Better retention can be achieved if the number of layers folded under the magnets is minimized.

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[1] Geri-Care® is a registered trademark of Geri-Care Products, LLC.
[2] Ibex® is a registered trademark of Springs Canada, Inc.
[3] Kenguard® is a registered trademark of Tyco International, Inc.

Component Handling

⚠ **CAUTION:**
To prevent component damage, ensure that your hands are clean, and **only** handle the P.C. board by its edges.

⚠ **CAUTION:**
When handling electronic components, wear an antistatic strap. Failure to do so could result in component damage.

⚠ **CAUTION:**
For shipping and storage, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

P.C. Board

When servicing the P.C. board, follow good handling practices. Mishandling a P.C. board can cause the following:

- P.C. board damage
- Shortened P.C. board life
- Unit malfunctions

Observe the following P.C. board handling rules:

- Ensure that hands are clean and free of moisture, oily liquids, etc.
- **Only** handle the P.C. board by its outer edges.
- Do not touch the P.C. board components. Finger contact with the board surface and/or with its components can leave a deposit that will result in board (and component) deterioration.
- When working with electronics, wear an appropriate antistatic strap, and ensure that it is properly grounded.
- Service the removed P.C. board at a static-free workstation that is properly grounded.
- For shipping and storage, place the removed P.C. board in an antistatic protective bag.

Lubrication Requirements

WARNING:
Follow the product manufacturer’s instructions. Failure to do so could result in personal injury or equipment damage.

CAUTION:
Do not use silicone-based lubricants. Equipment damage could occur.

Oilite®[1] bearings and bushings are utilized in several places on the system. By retaining oil, the pores give a self-lubricating quality to the bearings and bushings. If any silicone-based lubricant is applied to the bearings and bushings or anywhere else on the system, this self-lubricating quality is neutralized.

It is safe to apply the following lubricants to the system (see table 6-9 on page 6-35):

Table 6-9. Lubricants

Part Number	Description
8252 (100)	2 oz m-1 oil (apply to Oilite® bearings and bushings)
SA3351 (100)	4 oz lithium grease

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[1] Oilite® is a registered trademark of Beemer Precision, Incorporated.

Preventive Maintenance

WARNING:
Only facility-authorized personnel should perform preventive maintenance on the TotalCare® Bed System. Preventive maintenance performed by unauthorized personnel could result in personal injury or equipment damage.

The TotalCare® Bed System requires an effective maintenance program. We recommend that you perform **semi-annual** preventive maintenance (PM) and testing for Joint Commission on Accreditation of Healthcare Organizations (JCAHO). PM and testing not only meet JCAHO requirements but will help ensure a long, operative life for the TotalCare® Bed System. PM will minimize downtime due to excessive wear.

The following PM schedule guides you through a normal PM procedure on the TotalCare® Bed System. During this PM process, check each item on the schedule, and make the necessary adjustments.

Follow the PM schedule with the corresponding PM checklist. This checklist is designed to keep a running maintenance history and subsequent repair costs for one TotalCare® Bed System. However, your facility can modify this checklist or design another to fit your needs. Two effective ways to reduce downtime and ensure the patient remains comfortable are keeping close records and maintaining the TotalCare® Bed System.

Preventive Maintenance Schedule

The TotalCare® Bed System maintenance program must be effective to make sure that the life span of the bed will be long and productive. Completion of a maintenance program and performing checks on a recommended basis will help to minimize and reduce time between breakdown failures.

The preventive maintenance schedule outlined (see table 6-10 on page 6-37) is intended to guide the technician through normal preventive maintenance on the TotalCare® Bed System. Each item on the schedule must be checked and any necessary adjustments must be performed.

Table 6-10. Preventive Maintenance Schedule

Function	Procedure
Bed scale	Check the accuracy of the bed scale with different weights. Test for proper operation of the scale functions and adjustments.
Caregiver control panel	Test the bed function controls for proper operation of the function and momentary operation. Test all of the lockout controls, and individually check for proper operation.
Caster tires	Check the tires for cuts, wear, tread life, etc.
Central brake and steer	Test the brake casters to determine if the bed moves when you activate the brake. Test the steer mode to determine if both foot end casters lock in the steer mode (see removal, replacement, and adjustment procedures for additional information).
Chair limits	Operate the chair control from the flat position to the chair egress position limits. Check that the position sensors function properly.
Communications	Inspect and test the communication junction box. Test the SideCom® Communication System features for proper operation. Inspect the communication cable, including the male and female pins in the plug.
Control modules	The manifold assembly keeps users from accidental direct contact with all air module connectors, and keeps accidental fluid spills or sprays from entering air module connectors when the removable control modules are not installed. The manifold assembly keeps accidental spills or sprays of fluids from entering the space reserved or occupied by the control modules. Cleaning of this space is not normally required.
CPR release	Test the CPR release for proper operation and reset of the head cylinder.
Head section slide pivots, self-lubricating bearing, and slider pivot extrusions	Check for damage and proper operation. Replace components as necessary.

Function	Procedure
Electrical test	Test the bed for electrical leakage. Ground resistance must be less than 0.20 Ω. Leakage current must be less than 65 µA for 115V models, and less than 122 µA for 230V models. Also, check for leakage current at the nurse call connections. If the leakage current is greater than 65µA on a 115V bed or 122 µA on a 230V bed, check the following: • Ensure that the blower motor is isolated from the bed frame. • Ensure that the hydraulic pump motor is isolated from the bed frame. • Inspect the power cord for damage. • Inspect the line filter for damage.
Emergency Trendelenburg limits	Make sure that the pedals are accessible on both sides of the bed, and check for proper pedal functions as follows: • Lift the emergency Trendelenburg pedal. The head end lowers from the level position to 12°, relative to the foot end. Check the Trendelenburg indicator for degree accuracy of bed position. • Check that the emergency Trendelenburg pedal operates without AC power or battery power. Repeat the procedure using the emergency Trendelenburg pedal on the other side of the bed.
Foot articulating cylinder	Check for proper operation.
Foot hilow cylinder	Check for proper operation.
Foot retracting cylinder	Check for proper operation.
Headboard and footboard	Check the aesthetics.
Head cylinder	Check for proper operation.
Head hilow cylinder	Check for proper operation.
Head limits	Operate the head section to the full upper and lower limits. See “TotalCare® Bed System Specifications” on page 1-75. Check that the position sensors function properly.

Function	Procedure
Hilow limits	Operate the bed to the full upper and lower limits. See "TotalCare® Bed System Specifications" on page 1-75. Check that the head and foot hilow position sensors function properly.
Hydraulic tank	Check for proper level of hydraulic fluid in the reservoir (refer to procedure 4.29).
Knee cylinder	Check for proper operation.
Knee limits	Operate the knee section to the full upper and lower limits. See "TotalCare® Bed System Specifications" on page 1-75. Check that the position sensors function properly.
LED indicators	Check all LED indicators on the caregiver control panel and the Graphical Caregiver Interface (GCI)® Control for proper operation.
Night light	Check the night light for proper operating function.
Overall appearance	Check the general aesthetics of the bed. Touch up the paint where necessary. Inspect accessories, and replace as necessary. Inspect the hose connectors for identification and for proper connection.
Pivot points	Lubricate all pivot points on the bed.
Power cord and plug	Inspect the power cords and plugs for cuts, nicks, breaks, fraying, and for proper grounding.
Trendelenburg limits	Operate the bed to the Trendelenburg and Reverse Trendelenburg position limits. See "TotalCare® Bed System Specifications" on page 1-75. Check the limits and indicator accuracy for each position.
Siderail controls	Test the siderail controls for proper operation, and check for momentary operation of the controls.
Siderail frame	Test the siderail for proper latching. When the siderail is latched, an audible click should be heard. If latching is difficult, ensure that the latch is clean, and inspect for obstructions. If wear is found, replace the latch components. Test the dampener cylinders by releasing each siderail from the up position and allowing them to fall freely. Siderails should lower in a slow, smooth action.
Siderail cables	Check the siderail cables for cuts, nicks, breaks, fraying, and excessive wear. Replace as required.

Function	Procedure
Short stay surface	Check the ticking for punctures, cuts, or tears. Check inside the short stay surface for fluids, moisture, or stains. If any of these conditions exist, replace the ticking and all of the contaminated internal components. Check the foam for cuts or excessive wear. Replace components as required.
Treatment and Pulmonary surface	Check the ticking and air bladders for punctures, cuts, or tears. Check inside the treatment surface for fluids, moisture, or stains. If any of these conditions exist, replace the ticking and all of the contaminated internal components. Inspect the air blower. Inspect the surface control modules for condition. Check all of the hose connections (to the manifold, mattress, and inside of the mattress) and O-rings on manifold connectors to prevent air leaks. Check each zone for functions. Check all controls. Check the foam for cuts or excessive wear. Replace components as required.
Drive belt (IntelliDrive® Transport System)	Inspect for damage. Replace if any of the following is present: • Belt is off of the pulley • Divot is greater that ½" in length • Internal steel belt is broken and protruding out of the surface of the belt • Material breakdown due to unknown foreign substance
Transport handle zero (IntelliDrive® Transport System)	Refer to “Throttle Check (IntelliDrive® Transport System)” on page 2-226.

Preventive Maintenance Checklist

Table 6-11. Preventive Maintenance Checklist

Date																							**Function**
Hill-Rom	**Manufacturer**																						Bed scale
																							Caregiver control panel
																							Caster tires
																							Central brake
																							Chair limits
																							Communications
																							Control modules
	Model Number																						CPR release
																							Head section slide pivots, self-lubricating bearing, and slider pivot extrusions
																							Electrical test
																							Emer. Trendelenburg
																							Foot artic. cylinder
	Serial Number																						Foot hilow cylinder
																							Foot retracting cylinder
																							Headboard
																							Footboard
																							Head cylinder
																							Head hilow cylinder
																							Head limits
Total Cost for This Page																							**Labor Time:**
																							Repair Cost:
																							Inspected By:
																							Legend L=Lube C=Clean A=Adjust R=Repair or Replace O=Okay N=Not Applicable Remarks:

Date																							**Function**
Hill-Rom	**Manufacturer**																						Hilow limits
																							Knee cylinder
																							Knee limits
																							LED indicators
																							Night light
																							Overall appearance
																							Pivot points
																							Power cord and plug
	Model Number																						Preliminary tilt limits
																							Trendelenburg limits
																							Siderail controls
																							Siderail frame
																							Siderail cables
																							Short stay surface
																							Treatment surface
																							Pulmonary surface
	Serial Number																						Drive belt
																							Transport handle zero
Total Cost for This Page																							**Labor Time:**
																							Repair Cost:
																							Inspected By:
																							Legend L=Lube C=Clean A=Adjust R=Repair or Replace O=Okay N=Not Applicable Remarks:

Chapter 7
Accessories

Chapter Contents

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NOTES:

Accessories

⚠ **WARNING:**
Only accessories specifically identified below are authorized for use with the TotalCare® Bed System. Use of accessories **not** listed below could compromise the safety of the TotalCare® Bed System.

Accessories may be added or removed without the use of tools at the point of patient care by a caregiver. Accessories are interchangeable within a product configuration. For TotalCare® Bed System accessories, see table 7-1 on page 7-3.

Table 7-1. Accessories List

Product Number	Description
P155-12 (1900)	ISS bedpole unit
P27601 (1900)	Vertical oxygen holder
P294 (1900)	Transducer holder
P1926 (1900)	Physical safety restraints (seat belt)
P1927 (1900)	Sheet management
P1928 (1900)	Footprop alignment
P1929 (1900)	2" foot pad—TotalCare® Bed System
P1930 (1900)	Siderail pad
P1940 (1900)	Fracture frame adapter brackets, TotalCare® Bed System (for use with traction equipment from Texas Medical Industries, Inc. (TMI) or Orthopedic Systems, Inc. **only**)
P2217 (1900)	Standard IV rod
P1934 (1900)	Pendant control (without nurse call)
P193401 (1900)	Pendant control (with nurse call)

7.1 Infusion Support System—P155-12

Tools required: None

The Infusion Support System consists of a movable and adjustable IV rod that attaches to the head end of the system. The pole supports IV pumps or bags in a vertical orientation and raises or lowers the pumps or bags with respect to the bed frame.

Each Infusion Support System can support one infusion pump plus two liters of intravenous solution.

Installation

⚠ **WARNING:**
Do not exceed IV rod weight capacity. Personal injury or equipment damage could occur.

1. Hang up to 40 lb (18.1 kg) on an IV rod.

⚠ **CAUTION:**
Do not mount infusion pumps on the lower section of an IV rod. Interference with head section articulation could result.

2. Hang pumps on the upper section of an IV rod.

⚠ **WARNING:**
When lowering the upper section of an IV rod, always grasp and hold the upper section of the pole before pulling the release knob. Failure to do so could result in personal injury or equipment damage.

3. To deploy, follow these steps:
    a. Lift the IV pole from its stored position from behind the headboard.
    b. Make sure the pole drops and locks into position.
    c. Raise the upper section of the pole to the desired height.
4. To lower the upper section of an IV rod, follow these steps:
    a. Grasp the upper section of the rod.
    b. Pull the release knob.
    c. Hold the upper section of the rod as you lower it.

7.2 Oxygen Tank Holder—P27601

Tools required: None

The oxygen tank holder attaches to the head end of the intermediate frame in a vertical position. The Oxygen Tank Holder accommodates one E-size oxygen tank with a regulator. The mounting points are located to allow the affixed oxygen tank holders to pivot.

Installation

1. Install the mounting bar vertically into a mounting socket at the head end of the intermediate frame.
2. Place one E-size oxygen tank in the holder.
3. Tighten the holder thumbscrew.

NOTE:
The thumbscrew keeps the oxygen tank from rotating in the holder.

Removal

1. Loosen the thumbscrew that holds the tank securely in the holder.
2. Lift the tank out of the holder.
3. Lift up on the tank holder, and remove it from the mounting sockets.

7.3 Physical Safety Belts—P1926

Tools required: None

The physical safety belts are adjustable, which allows the caregiver to adjust them to the size of the patient. The physical safety belts help maintain proper patient position.

WARNING:
Do not use the physical safety belts as a restraint device. Personal injury could occur.

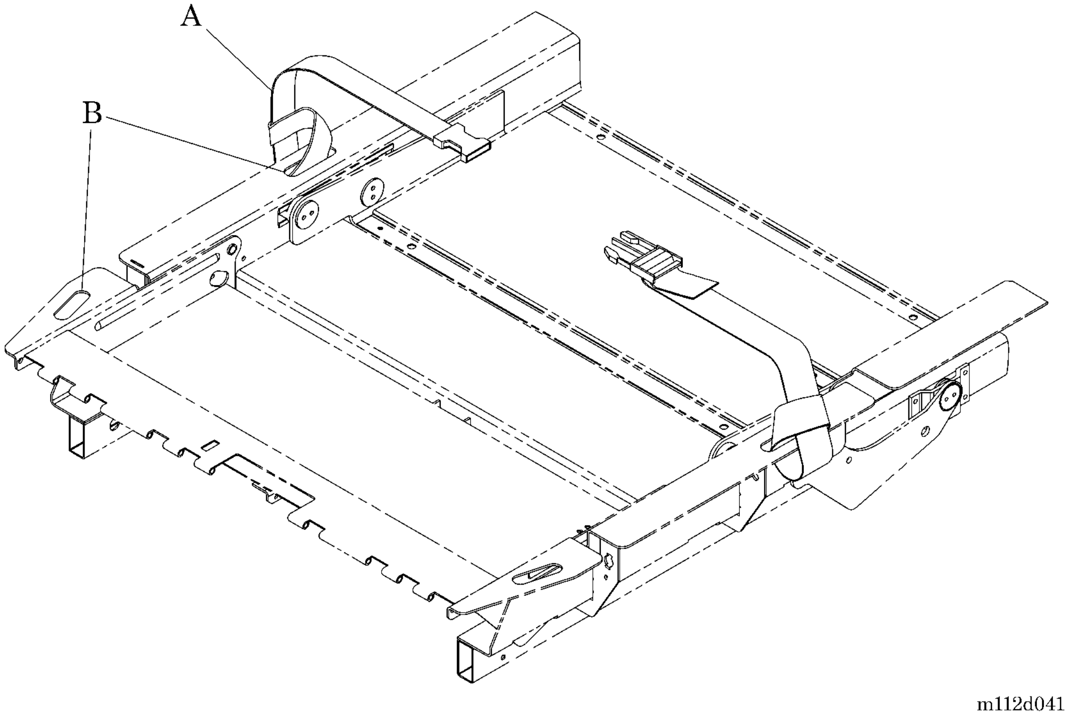
WARNING:
Patient injury may result if patient seat belts or straps are attached to any place other than their designated weigh frame attachment points.

CAUTION:
Do not attach patient straps, sheets, or belts to any point other than the weigh frame designated attachment points.

Installation

1. Install seat belts (A) only through the weigh frame attachment points (B) (see figure 7-1 on page 7-7).

Figure 7-1. Physical Restraint Attachment Locations



2. Articulate the weigh frame to ensure that seat belts or any other patient accessories do not interfere with the frame movement.

Removal

Reverse the installation procedure to remove the physical safety belts.

7.4 Standard IV Rod—P2217

Tools required: None

The IV rod is a removable, telescopic pole that installs at any of the four corners of the system in the holes provided.

WARNING:
Do not exceed IV rod weight capacity, personal injury or equipment damage could result.

WARNING:
When lowering the upper section of an IV rod, always grasp and hold the upper section of the pole before pulling the release knob. Failure to do so could result in personal injury or equipment damage.

Installation

1. Install the IV rod in an equipment socket at a head end corner of the bed.
2. Rotate the pole a quarter turn to lock it in place.

Removal

Reverse the installation procedure to remove the IV Rod.

7.5 Fracture Frame Adapter Brackets—P1940

Tools required: None

WARNING:
Do not use the full fracture frame equipment with the TotalCare® Bed System without installing the fracture frame adapter brackets. Use of the full fracture frame without the fracture frame adapter brackets could result in structural failure of the bed and/or the traction equipment, loss of chair egress capability, and scale inaccuracy. Possible personal injury or equipment damage could occur.

WARNING:
Lock out the knee controls when a full fracture frame is used for mounting Buck's traction. Failure to do so could result in personal injury or equipment damage.

WARNING:
Lock out the head and knee controls when a full fracture frame is used for cervical traction. Failure to do so could result in personal injury or equipment damage.

WARNING:
Do not use the fracture frame equipment to push or steer the bed. Use the transport handles, foot prop, or the siderails. Failure to do so could result in personal injury or equipment damage.

Installation

1. Raise the head and thigh section approximately 20°.

SHOCK HAZARD:
To minimize the risk of electrical shock or damage to equipment, disconnect all electrical power to the TotalCare® Bed System before working on it. Failure to do so could result in personal injury or equipment damage.

2. Unplug the bed from its power source.

3. Disable the battery. See "Disable Battery Operation" on page 6-3.

4. Set the brake casters to the brake position.

NOTE:
The mounting holes for the adapter brackets are located on the weigh frame, under the head and thigh section of the bed.

5. Slide and position the mounting plate for the frame adapter bracket over the tube of the weigh frame.
6. Align the square holes in the frame adapter bracket mounting plate with the round holes in the weigh frame of the bed.
7. Install the carriage bolts from the top of the weigh frame, and tighten the wing nut on the bottom of the weigh frame.
8. Install the remaining three frame adapter brackets onto the bed by repeating step 5 through step 7.

WARNING:
Refer to the fracture frame equipment manufacturer’s user’s manual for proper installation and setup of the fracture frame.

9. Install the fracture frame equipment by following the manufacturer’s instructions.

WARNING:
After the fracture frame equipment is installed, check the thigh section for proper, unobstructed movement, and check the siderails for latching in the up position, and proper operation. Failure to do so could result in personal injury or equipment damage.

WARNING:
Fracture frames used with the fracture frame adapter brackets should be no taller than 54" (137 cm) from the top of the brackets. Possible personal injury or equipment damage could occur.

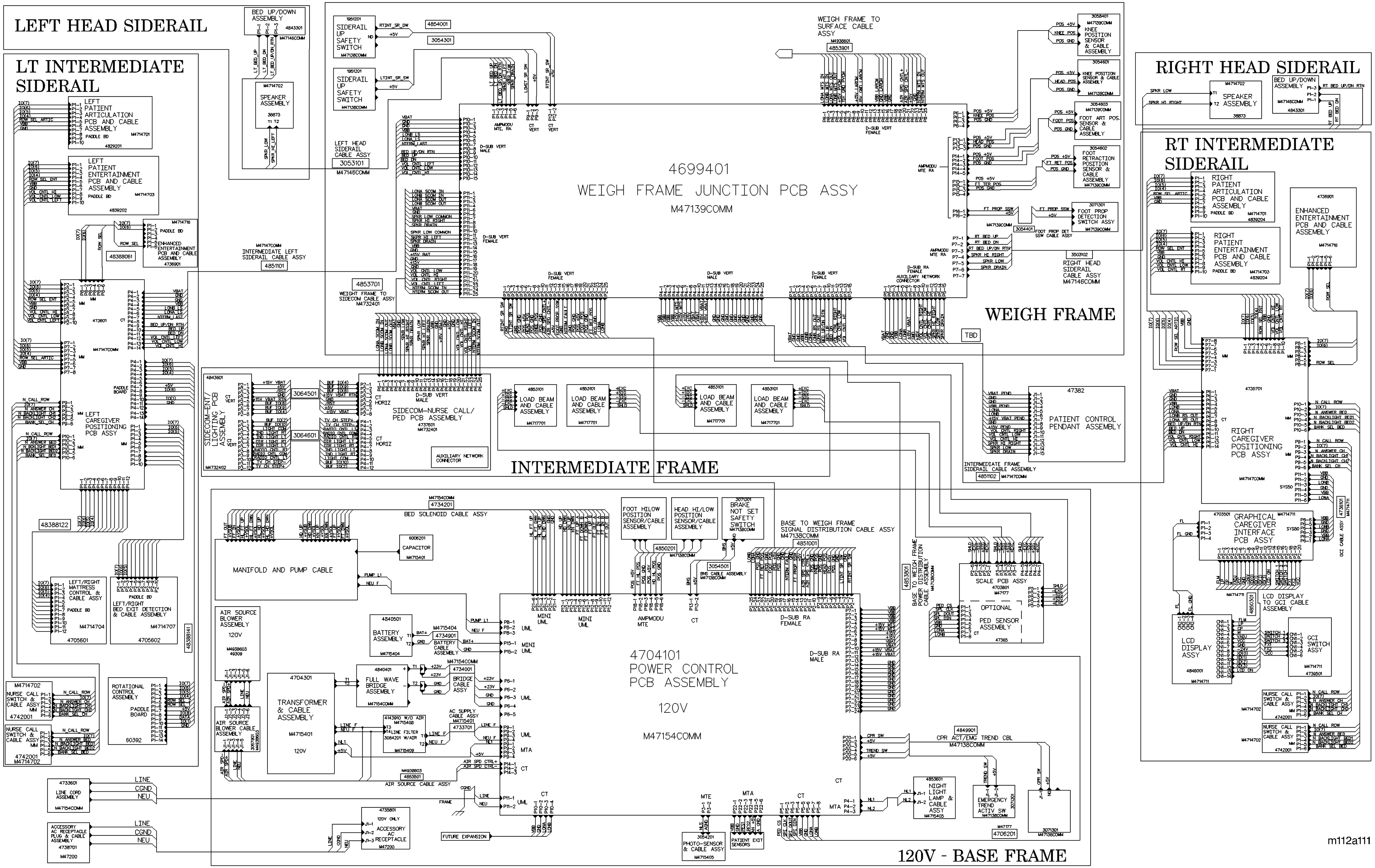
WARNING:
Fracture frames used with the TotalCare® Bed System should not extend beyond the head end, foot end, or sides of the bed. Possible personal injury or equipment damage could occur.

Removal

Reverse the installation procedure to remove the fracture frame adapter brackets.

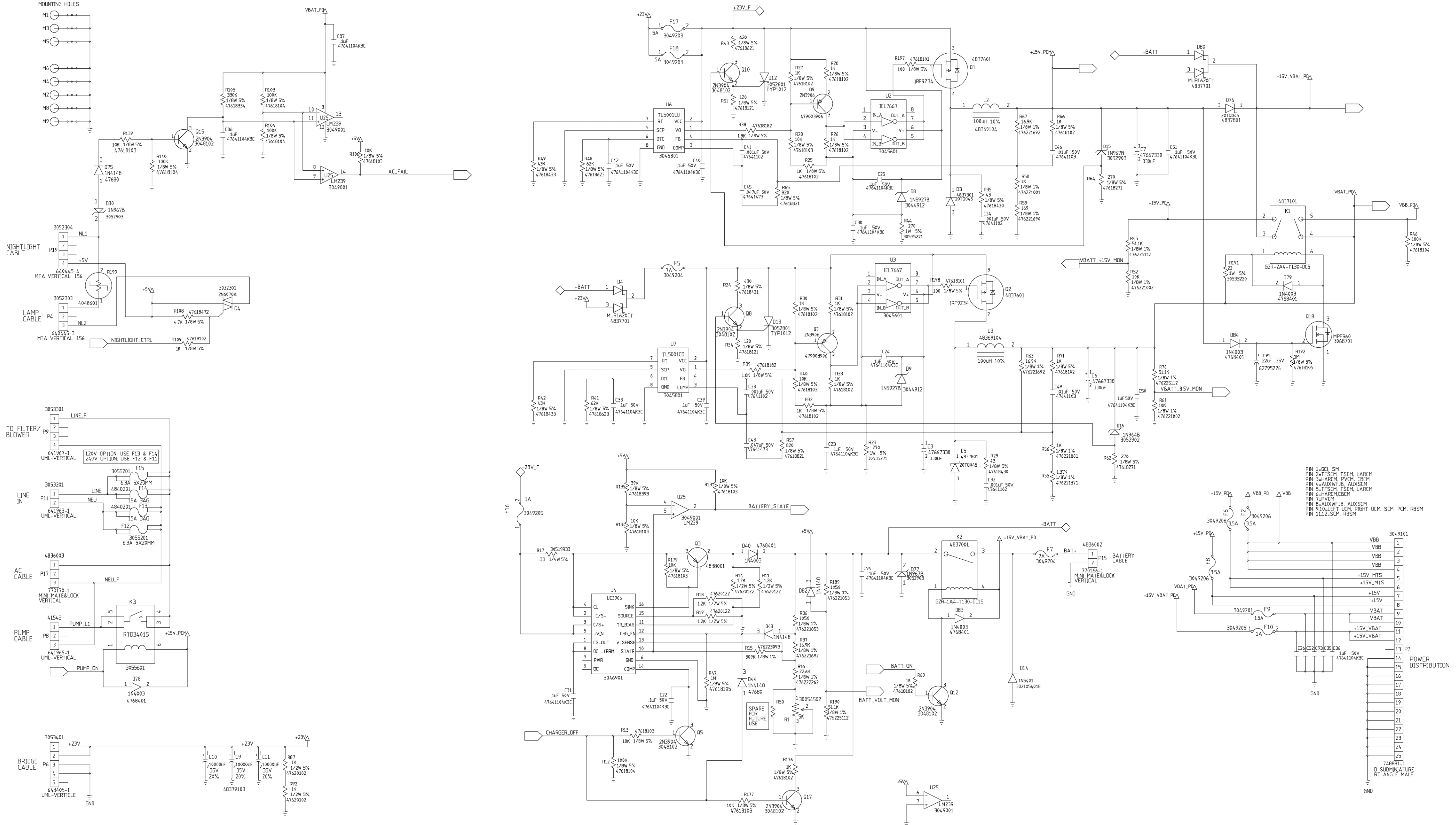
NOTES:

System Wiring Diagram—TotalCare® Bed System—120V (P/N 47030)


LEFT HEAD SIDERAIL
BED UP/DOWN ASSEMBLY
LT INTERMEDIATE SIDERAIL
LEFT PATIENT ARTICULATION PCB AND CABLE ASSEMBLY
LEFT PATIENT ENTERTAINMENT PCB AND CABLE ASSEMBLY
ENHANCED ENTERTAINMENT PCB AND CABLE ASSEMBLY
SPEAKER ASSEMBLY
SIDERAIL UP SAFETY SWITCH
LEFT HEAD SIDERAIL CABLE ASSY
INTERMEDIATE LEFT SIDERAIL CABLE ASSY
LEFT CAREGIVER POSITIONING PCB ASSY
WEIGH FRAME TO SIDECOM CABLE ASSY
4699401
WEIGH FRAME JUNCTION PCB ASSY
M47139COMM
WEIGH FRAME TO SURFACE CABLE ASSY
KNEE POSITION SENSOR & CABLE ASSEMBLY
HEAD POSITION SENSOR & CABLE ASSEMBLY
FOOT ART POS. SENSOR & CABLE ASSEMBLY
FOOT RETRACTION POSITION SENSOR & CABLE ASSEMBLY
FOOT PROP DETECTION SWITCH ASSY
RIGHT HEAD SIDERAIL CABLE ASSY
WEIGH FRAME
RIGHT HEAD SIDERAIL
RT INTERMEDIATE SIDERAIL
RIGHT PATIENT ARTICULATION PCB AND CABLE ASSEMBLY
RIGHT PATIENT ENTERTAINMENT PCB AND CABLE ASSEMBLY
RIGHT CAREGIVER POSITIONING PCB ASSY
GRAPHICAL CAREGIVER INTERFACE PCB ASSY
LCD DISPLAY TO GCI CABLE ASSEMBLY
LCD DISPLAY ASSY
GCI SWITCH ASSY
NURSE CALL SWITCH & CABLE ASSY
SIDECOM-ENT/LIGHTING PCB ASSEMBLY
SIDECOM-NURSE CALL/PED PCB ASSEMBLY
AUXILIARY NETWORK CONNECTOR
LOAD BEAM AND CABLE ASSEMBLY
PATIENT CONTROL PENDANT ASSEMBLY
INTERMEDIATE FRAME SIDERAIL CABLE ASSEMBLY
INTERMEDIATE FRAME
LEFT/RIGHT MATTRESS CONTROL & CABLE ASSY
LEFT/RIGHT BED EXIT DETECTION & CABLE ASSEMBLY
ROTATIONAL CONTROL ASSEMBLY
BED SOLENOID CABLE ASSY
MANIFOLD AND PUMP CABLE
CAPACITOR
AIR SOURCE BLOWER ASSEMBLY
AIR SOURCE BLOWER CABLE ASSEMBLY
BATTERY ASSEMBLY
BATTERY CABLE ASSY
FULL WAVE BRIDGE ASSEMBLY
BRIDGE CABLE ASSY
TRANSFORMER & CABLE ASSEMBLY
LINE FILTER
AC SUPPLY CABLE ASSY
AIR SOURCE CABLE ASSY
FOOT HI/LOW POSITION SENSOR/CABLE ASSEMBLY
HEAD HI/LOW POSITION SENSOR/CABLE ASSEMBLY
BRAKE NOT SET SAFETY SWITCH
BMS CABLE ASSEMBLY
BASE TO WEIGH FRAME SIGNAL DISTRIBUTION CABLE ASSY
BASE TO WEIGH FRAME POWER DISTRIBUTION CABLE ASSEMBLY
SCALE PCB ASSY
OPTIONAL PED SENSOR ASSEMBLY
4704101
POWER CONTROL PCB ASSEMBLY
120V
M47154COMM
CPR ACT/EMG TREND CBL
NIGHT LIGHT LAMP & CABLE ASSY
EMERGENCY TREND ACTIV SW
LINE CORD ASSEMBLY
ACCESSORY AC RECEPTACLE PLUG & CABLE ASSEMBLY
ACCESSORY AC RECEPTACLE
FUTURE EXPANSION
PHOTO-SENSOR & CABLE ASSY
PATIENT EXIT SENSORS
120V - BASE FRAME
m112a111

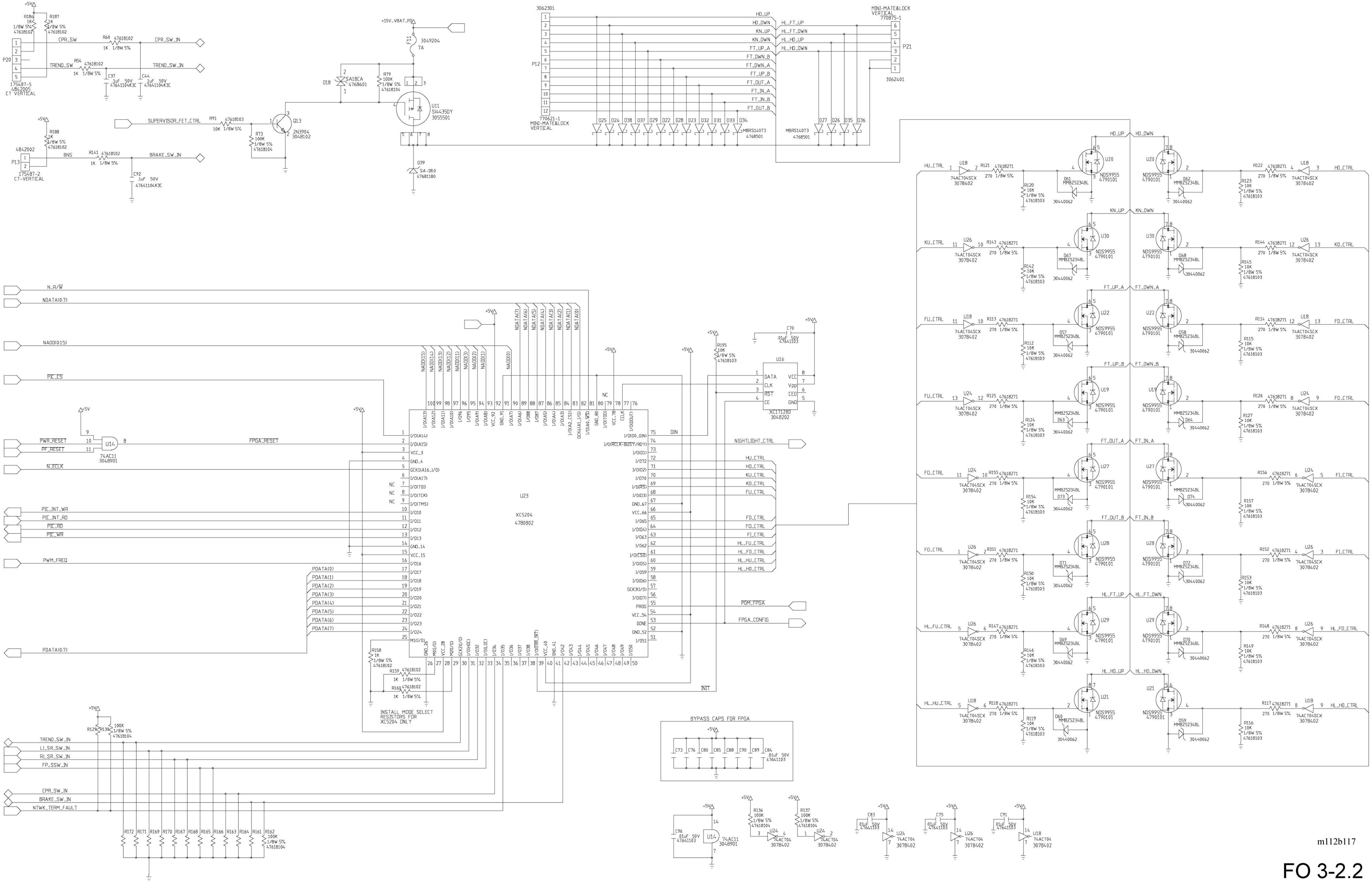
P.C. Board Wiring Diagram—Power Control Board (P/N 47040) Sheet 1 of 4

2 of 4 3 of 4 4 of 4 Chapter 3


MOUNTING HOLES
M1
M3
M5
M6
M4
M2
M8
M9
VBAT_PD
NIGHTLIGHT CABLE
P19
3052304
LAMP CABLE
P4
3052303
MTA VERTICAL .156
NIGHTLIGHT_CTRL
AC_FAIL
U25
LM239
3049001
Q15
2N3904
3048102
TO FILTER/ BLOWER
P9
LINE_F
120V OPTION: USE F13 & F14
240V OPTION: USE F12 & F15
LINE IN
P11
LINE
NEU
AC CABLE
P17
NEU_F
PUMP CABLE
P8
PUMP_L1
PUMP_ON
K3
RTD34015
BRIDGE CABLE
P6
+23V
GND
+23V_F
F17
F18
3049203
U6
TL5001CD
U2
ICL7667
Q1
IRF9Z34
L2
100uH 10%
+15V_PCM
+BATT
D80
MUR1620CT
D76
20TQ045
+15V_VBAT_PD
D4
F5
7A
3049204
U7
TL5001CD
U3
ICL7667
Q2
IRF9Z34
L3
100uH 10%
VBATT_+15V_MON
VBATT_8.5V_MON
K1
G2R-2A4-T30-DC5
Q18
MPF960
VBB_PD
+15V_PD
F16
1A
3049205
U25
BATTERY_STATE
U4
UC3906
K2
G2R-1A4-T30-DC15
P15
BATTERY CABLE
770166-1
MINI-MATE&LOCK VERTICAL
Q3
Q5
Q12
Q17
CHARGER_OFF
BATT_ON
BATT_VOLT_MON
SPARE FOR FUTURE USE
F7
BATT+
F6
F2
F8
F9
F10
3049206
3.5A
PIN 1=GCL_SM
PIN 2=TFSCM, TSCM, LARCM
PIN 3=HARCM, PVCM, CBCM
PIN 4=AUXWFJB, AUXSCM
PIN 5=TFSCM, TSCM, LARCM
PIN 6=HARCM,CBCM
PIN 7=PVCM
PIN 8=AUXWFJB, AUXSCM
PIN 9,10=LEFT UCM, RIGHT UCM, SCM, PCM, RBSM
PIN 11,12=SCM, RBSM
P7
POWER DISTRIBUTION
VBB
+15V_MTS
+15V
VBAT
+15V_VBAT
748881-1
D-SUBMINIATURE RT ANGLE MALE
3049101

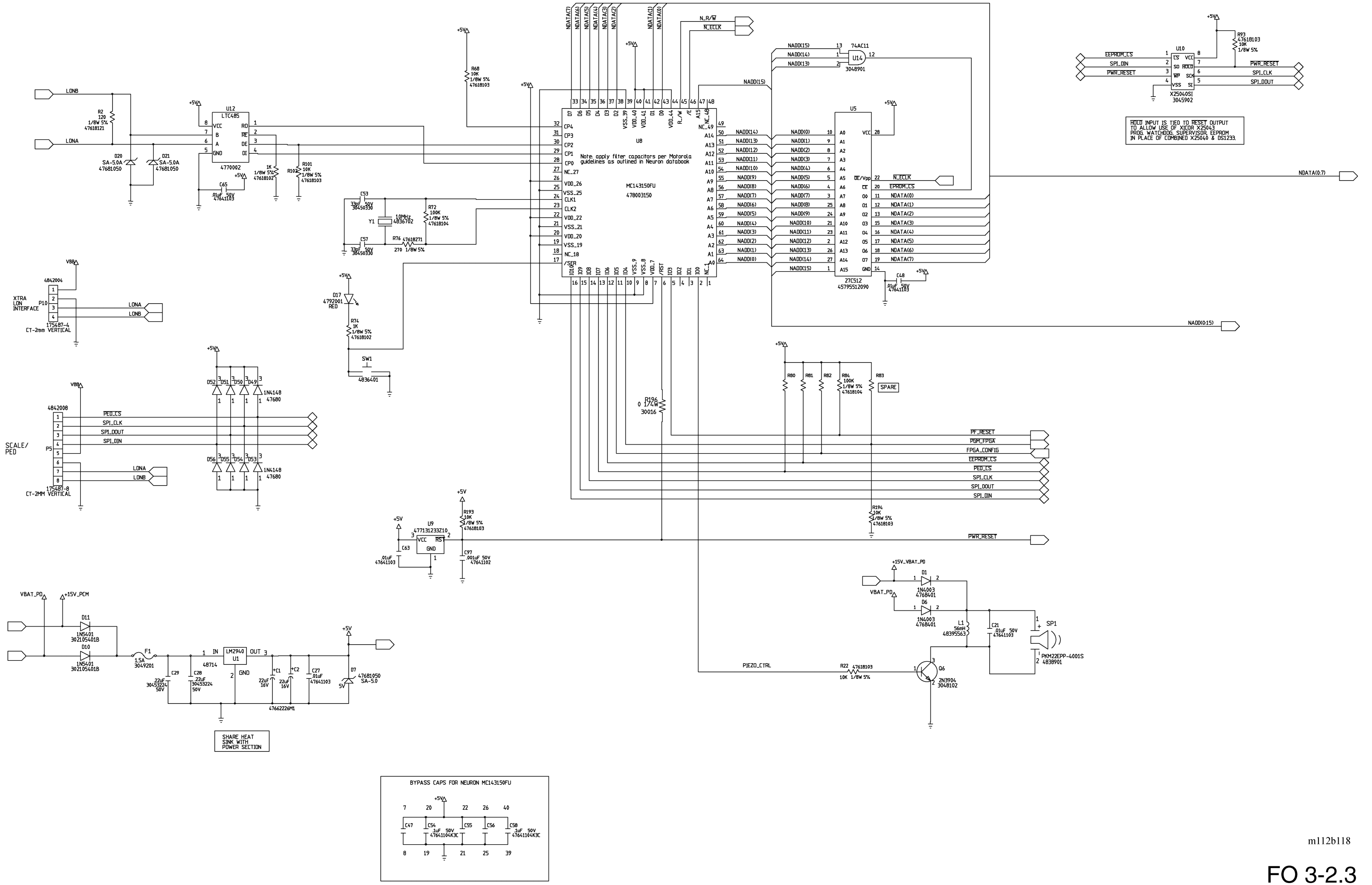
m112b116

P.C. Board Wiring Diagram—Power Control Board (P/N 47040) Sheet 2 of 4

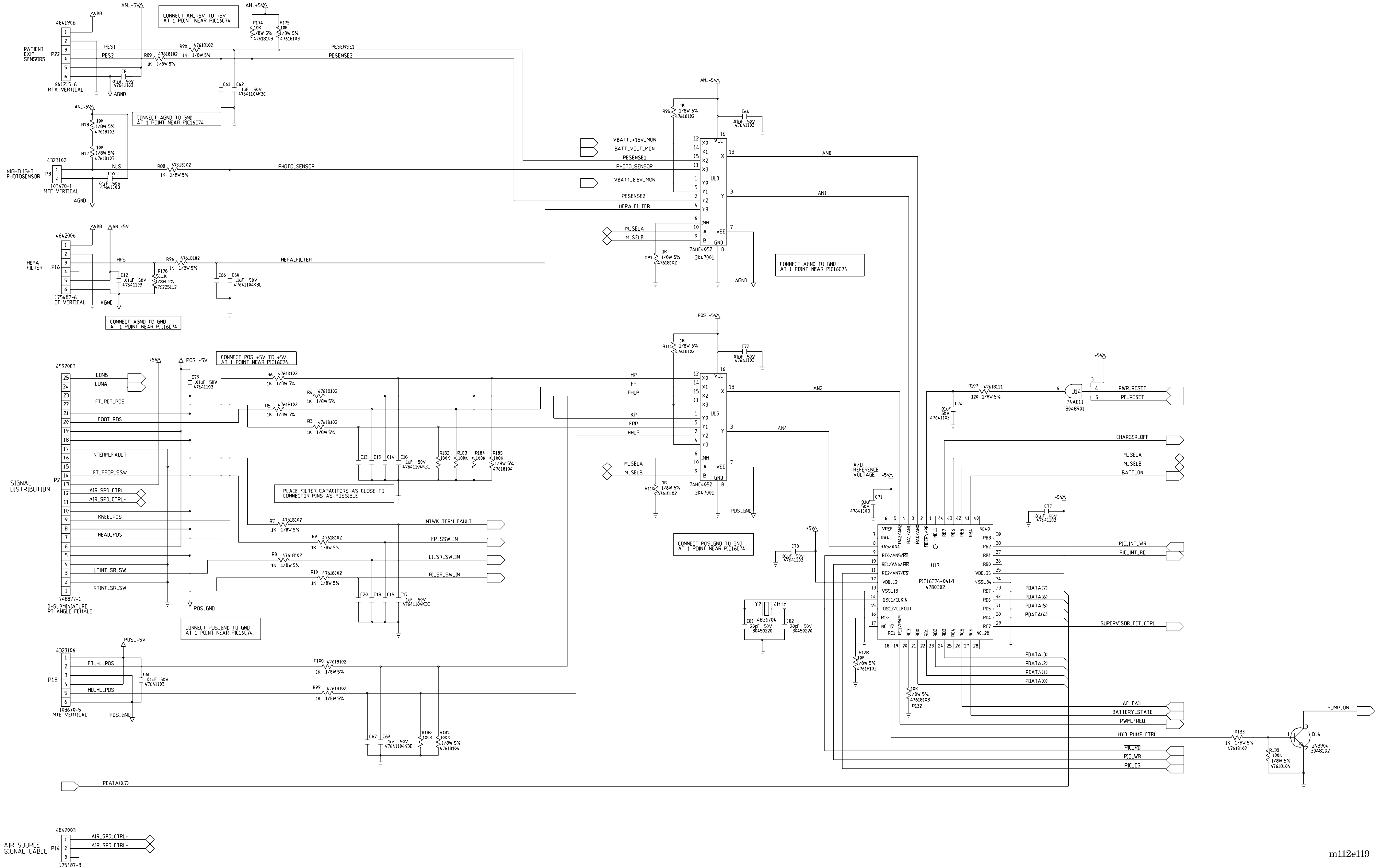

P20
CPR_SW
CPR_SW_IN
TREND_SW
TREND_SW_IN
175487-5
4842005
CT VERTICAL
+15V_VBAT_PO
F11
3049204
7A
D18
SA18CA
4768601
U11
Si4435DY
3055501
SUPERVISOR_FET_CTRL
Q13
2N3904
3048102
D39
SA-18.0
47681180
P13
4842002
175487-2
CT-VERTICAL
BNS
BRAKE_SW_IN
3062301
P12
770621-1
MINI-MATE&LOCK
VERTICAL
HD_UP
HD_DWN
KN_UP
KN_DWN
FT_UP_A
FT_DWN_B
FT_DWN_A
FT_UP_B
FT_OUT_A
FT_IN_A
FT_IN_B
FT_OUT_B
HL_FT_UP
HL_FT_DWN
HL_HD_UP
HL_HD_DWN
MINI-MATE&LOCK
VERTICAL
770875-1
P21
3062401
MBRS140T3
4768501
HU_CTRL
HD_CTRL
KU_CTRL
KD_CTRL
FU_CTRL
FD_CTRL
FO_CTRL
FI_CTRL
HL_FU_CTRL
HL_FD_CTRL
HL_HU_CTRL
HL_HD_CTRL
74ACT04SCX
3078402
NDS9955
4790101
MMBZ5234BL
30440062
N_R/W
NDATA(0:7)
NADD(0:15)
PIC_CS
PWR_RESET
PF_RESET
U14
74AC11
3048901
FPGA_RESET
N_ECLK
PIC_INT_WR
PIC_INT_RD
PIC_RD
PIC_WR
PWM_FREQ
PDATA(0:7)
U23
XC5204
4780802
U16
XC17128D
3048202
DIN
NIGHTLIGHT_CTRL
PGM_FPGA
FPGA_CONFIG
INIT
INSTALL MODE SELECT
RESISTORS FOR
XC5204 ONLY
TREND_SW_IN
LI_SR_SW_IN
RI_SR_SW_IN
FP_SSW_IN
CPR_SW_IN
BRAKE_SW_IN
NTWK_TERM_FAULT
BYPASS CAPS FOR FPGA
.01uF 50V
47641103
74ACT04
3078402

m112b117

P.C. Board Wiring Diagram—Power Control Board (P/N 47040) Sheet 3 of 4


LONB
LONA
U12
LTC485
4770002
D20 SA-5.0A 47681050
D21 SA-5.0A 47681050
R2 120 1/8W 5% 47618121
C65 .01uF 50V 47641103
R101 10K 1/8W 5% 47618103
R68 10K 1/8W 5% 47618103
U8
MC143150FU
478003150
Note: apply filter capacitors per Motorola guidelines as outlined in Neuron databook
C53 33pF 50V 30450330
C57 33pF 50V 30450330
Y1 10MHz 4836702
R72 100K 1/8W 5% 47618104
R76 47618271 270 1/8W 5%
D17 4792001 RED
R74 1K 1/8W 5% 47618102
SW1 4836401
XTRA LON INTERFACE P10
4842004
175487-4 CT-2mm VERTICAL
SCALE/PED P5
4842008
175487-8 CT-2MM VERTICAL
PED_CS
SPI_CLK
SPI_DOUT
SPI_DIN
D52 D51 D50 D49 1N4148 47680
D56 D55 D54 D53 1N4148 47680
R196 0 1/4W 30016
U5
27C512
45795512090
U14 74AC11 3048901
N_R/W
N_ECLK
NADD(0:15)
NDATA(0:7)
C48 .01uF 50V 47641103
U10 X25040SI 3045902
EEPROM_CS
PWR_RESET
R93 47618103 10K 1/8W 5%
HOLD INPUT IS TIED TO RESET OUTPUT TO ALLOW USE OF XICOR X25043 PROG. WATCHDOG, SUPERVISOR, EEPROM IN PLACE OF COMBINED X25040 & DS1233.
R80 R81 R82
R84 100K 1/8W 5% 47618104
R83 SPARE
PF_RESET
PGM_FPGA
FPGA_CONFIG
R194 10K 1/8W 5% 47618103
U9 477131233Z10
C63 .01uF 47641103
R193 10K 1/8W 5% 47618103
C97 .001uF 50V 47641102
+15V_VBAT_PD
VBAT_PD
D1 1N4003 4768401
D6 1N4003 4768401
L1 56mH 48395563
C21 .01uF 50V 47641103
SP1 PKM22EPP-4001S 4838901
PIEZO_CTRL
R22 47618103 10K 1/8W 5%
Q6 2N3904 3048102
VBAT_PD
+15V_PCM
D11 1N5401 302105401B
D10 1N5401 302105401B
F1 1.5A 3049201
LM2940 U1 48714
C29 22uF 30453224 50V
C28 22uF 30453224 50V
C1 22uF 16V
C2 22uF 16V
C27 .01uF 47641103
47662226M1
D7 47681050 SA-5.0
SHARE HEAT SINK WITH POWER SECTION
BYPASS CAPS FOR NEURON MC143150FU
C47 C54 C55 C56 C58
.1uF 50V 47641104K3C

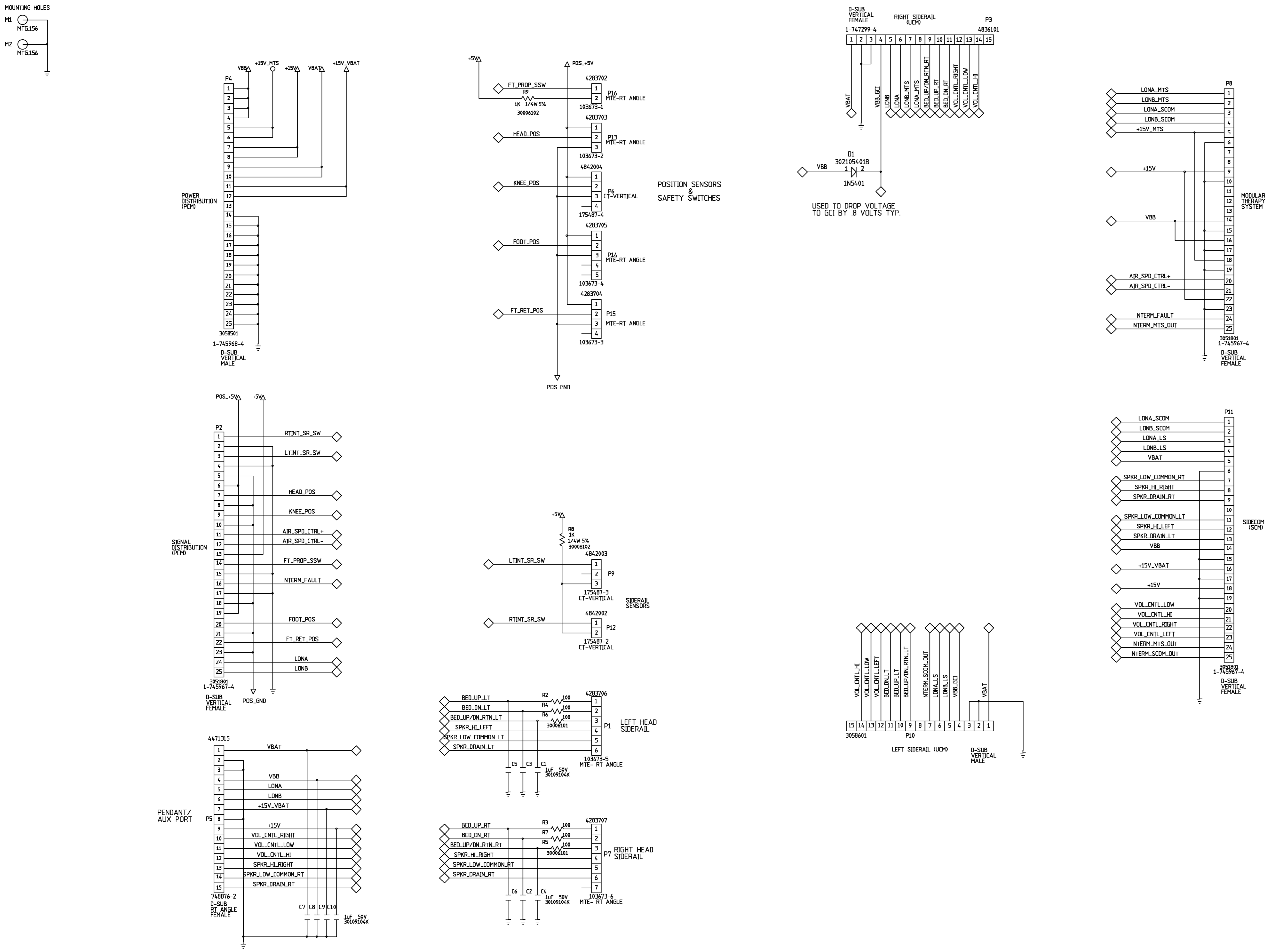
P.C. Board Wiring Diagram—Power Control Board (P/N 47040) Sheet 4 of 4



CONNECT AN_+5V TO +5V AT 1 POINT NEAR PIC16C74.
CONNECT AGND TO GND AT 1 POINT NEAR PIC16C74.
CONNECT POS_+5V TO +5V AT 1 POINT NEAR PIC16C74.
CONNECT POS_GND TO GND AT 1 POINT NEAR PIC16C74.
PLACE FILTER CAPACITORS AS CLOSE TO CONNECTOR PINS AS POSSIBLE
PATIENT EXIT SENSORS
P22
4841906
641215-6 MTA VERTICAL
PES1
PES2
PESENSE1
PESENSE2
NIGHTLIGHT PHOTOSENSOR
P3
4323102
103670-1 MTE VERTICAL
NLS
PHOTO_SENSOR
HEPA FILTER
P16
4842006
175487-6 CT VERTICAL
HFS
HEPA_FILTER
VBATT_+15V_MON
BATT_VOLT_MON
VBATT_8.5V_MON
M_SELA
M_SELB
U13
74HC4052
3047001
AN0
AN1
AN2
AN4
U15
SIGNAL DISTRIBUTION
P2
4592003
748877-1 D-SUBMINIATURE RT ANGLE FEMALE
LONB
LONA
FT_RET_POS
FOOT_POS
NTERM_FAULT
FT_PROP_SSW
AIR_SPD_CTRL-
AIR_SPD_CTRL+
KNEE_POS
HEAD_POS
LTINT_SR_SW
RTINT_SR_SW
HP
FP
FHLP
KP
FRP
HHLP
NTWK_TERM_FAULT
FP_SSW_IN
LI_SR_SW_IN
RI_SR_SW_IN
P18
4323106
103670-5 MTE VERTICAL
FT_HL_POS
HD_HL_POS
POS_GND
POS_+5V
AN_+5V
AGND
PDATA(0:7)
A/D REFERENCE VOLTAGE
U17
PIC16C74-04I/L
4780302
Y2 4MHz
4836704
U14
74AC11
3048901
PWR_RESET
PF_RESET
CHARGER_OFF
BATT_ON
PIC_INT_WR
PIC_INT_RD
PDATA(7)
PDATA(6)
PDATA(5)
PDATA(4)
PDATA(3)
PDATA(2)
PDATA(1)
PDATA(0)
SUPERVISOR_FET_CTRL
AC_FAIL
BATTERY_STATE
PWM_FREQ
HYD_PUMP_CTRL
PIC_RD
PIC_WR
PIC_CS
PUMP_ON
Q16
2N3904
3048102
AIR SOURCE SIGNAL CABLE
P14
4842003
175487-3 CT VERTICAL

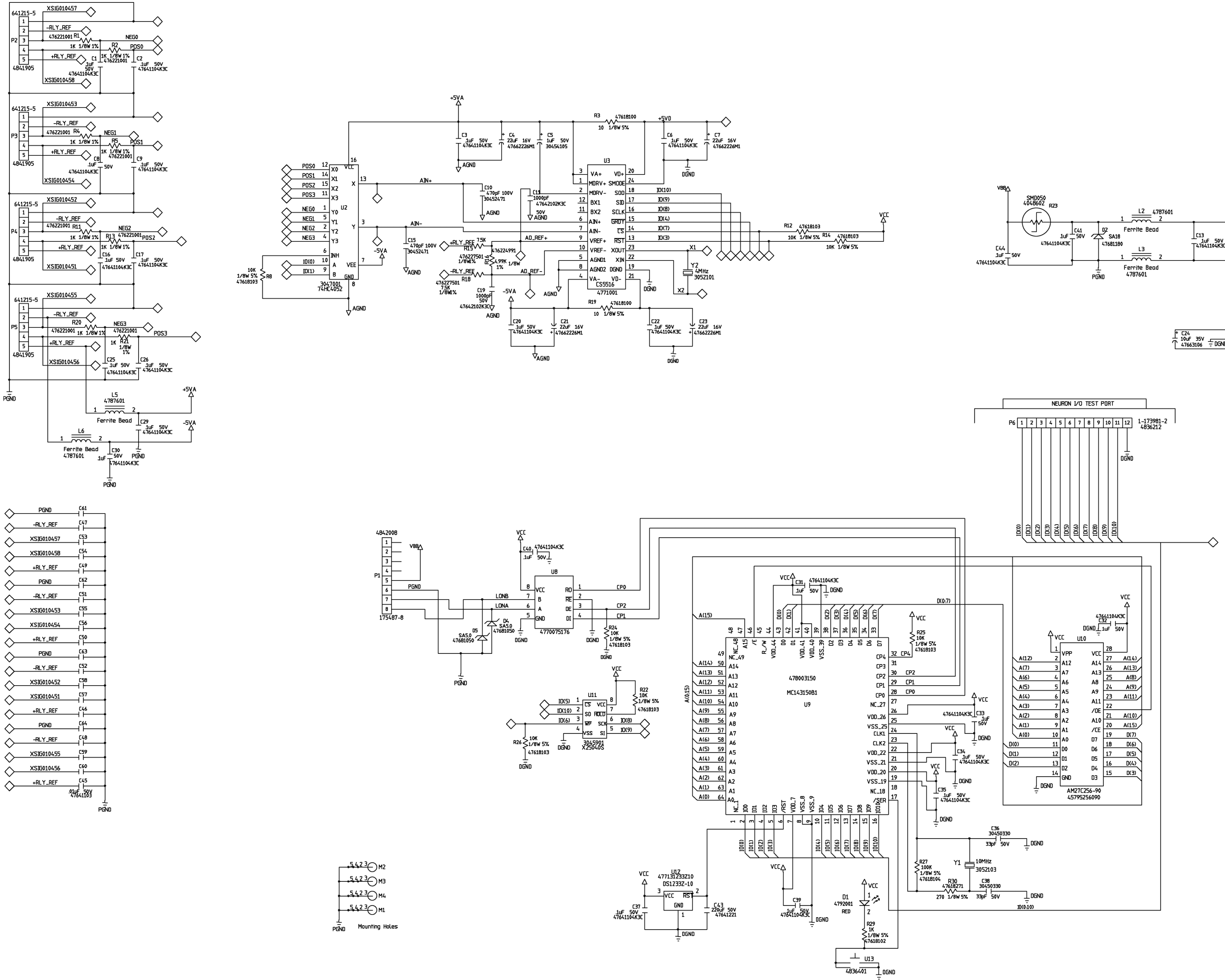
m112e119

P.C. Board Wiring Diagram—Weigh Frame Junction (P/N 46994)


MOUNTING HOLES
M1 MTG.156
M2 MTG.156
POWER DISTRIBUTION (PCM)
P4
VBB
+15V_MTS
+15V
VBAT
+15V_VBAT
3058501
1-745968-4
D-SUB VERTICAL MALE
+5V
POS_+5V
FT_PROP_SSW
R9 1K 1/4W 5% 30006102
4283702
P16 MTE-RT ANGLE
103673-1
HEAD_POS
4283703
P13 MTE-RT ANGLE
103673-2
KNEE_POS
4842004
P6 CT-VERTICAL
175487-4
FOOT_POS
4283705
P14 MTE-RT ANGLE
103673-4
FT_RET_POS
4283704
P15 MTE-RT ANGLE
103673-3
POS_GND
POSITION SENSORS & SAFETY SWITCHES
D-SUB VERTICAL FEMALE
1-747299-4
RIGHT SIDERAIL (UCM)
P3
4836101
VBAT
VBB_GCI
LONB
LONA
LONB_MTS
LONA_MTS
BED_UP/DN_RTN_RT
BED_UP_RT
BED_DN_RT
VOL_CNTL_RIGHT
VOL_CNTL_LOW
VOL_CNTL_HI
D1 302105401B 1N5401
VBB
USED TO DROP VOLTAGE TO GCI BY .8 VOLTS TYP.
P8
LONA_MTS
LONB_MTS
LONA_SCOM
LONB_SCOM
+15V_MTS
+15V
VBB
AIR_SPD_CTRL+
AIR_SPD_CTRL-
NTERM_FAULT
NTERM_MTS_OUT
MODULAR THERAPY SYSTEM
3051801
1-745967-4
D-SUB VERTICAL FEMALE
POS_+5V
+5V
P2
RTINT_SR_SW
LTINT_SR_SW
HEAD_POS
KNEE_POS
AIR_SPD_CTRL+
AIR_SPD_CTRL-
FT_PROP_SSW
NTERM_FAULT
FOOT_POS
FT_RET_POS
LONA
LONB
SIGNAL DISTRIBUTION (PCM)
3051801
1-745967-4
D-SUB VERTICAL FEMALE
POS_GND
+5V
R8 1K 1/4W 5% 30006102
LTINT_SR_SW
4842003
P9
175487-3 CT-VERTICAL
SIDERAIL SENSORS
RTINT_SR_SW
4842002
P12
175487-2 CT-VERTICAL
P11
LONA_SCOM
LONB_SCOM
LONA_LS
LONB_LS
VBAT
SPKR_LOW_COMMON_RT
SPKR_HI_RIGHT
SPKR_DRAIN_RT
SPKR_LOW_COMMON_LT
SPKR_HI_LEFT
SPKR_DRAIN_LT
VBB
+15V_VBAT
+15V
VOL_CNTL_LOW
VOL_CNTL_HI
VOL_CNTL_RIGHT
VOL_CNTL_LEFT
NTERM_MTS_OUT
NTERM_SCOM_OUT
SIDECOM (SCM)
3051801
1-745967-4
D-SUB VERTICAL FEMALE
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
BED_DN_LT
BED_UP_LT
BED_UP/DN_RTN_LT
NTERM_SCOM_OUT
LONA_LS
LONB_LS
VBB_GCI
VBAT
3058601
P10
LEFT SIDERAIL (UCM)
D-SUB VERTICAL MALE
BED_UP_LT
BED_DN_LT
BED_UP/DN_RTN_LT
SPKR_HI_LEFT
SPKR_LOW_COMMON_LT
SPKR_DRAIN_LT
R2 100
R4 100
R6 100
30006101
4283706
P1 LEFT HEAD SIDERAIL
103673-5 MTE- RT ANGLE
C5 C3 C1 1uF 50V 30109104K
4471315
PENDANT/ AUX PORT
P5
VBAT
VBB
LONA
LONB
+15V_VBAT
+15V
VOL_CNTL_RIGHT
VOL_CNTL_LOW
VOL_CNTL_HI
SPKR_HI_RIGHT
SPKR_LOW_COMMON_RT
SPKR_DRAIN_RT
748876-2
D-SUB RT ANGLE FEMALE
C7 C8 C9 C10
1uF 50V 30109104K
BED_UP_RT
BED_DN_RT
BED_UP/DN_RTN_RT
SPKR_HI_RIGHT
SPKR_LOW_COMMON_RT
SPKR_DRAIN_RT
R3 100
R7 100
R5 100
30006101
4283707
P7 RIGHT HEAD SIDERAIL
103673-6 MTE- RT ANGLE
C6 C2 C4 1uF 50V 30109104K

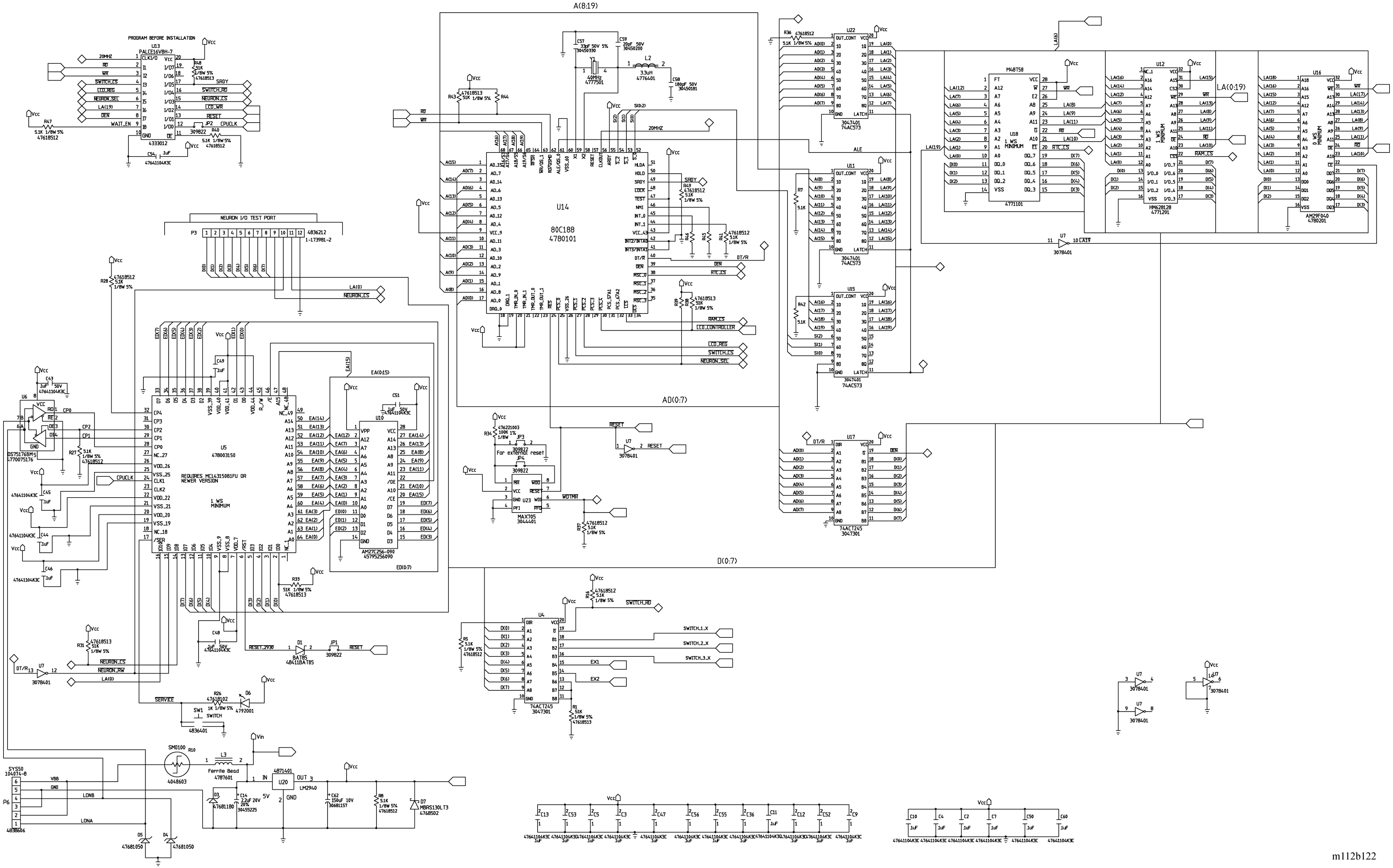
m112b120

P.C. Board Wiring Diagram—Scale Instrument (P/N 47038)

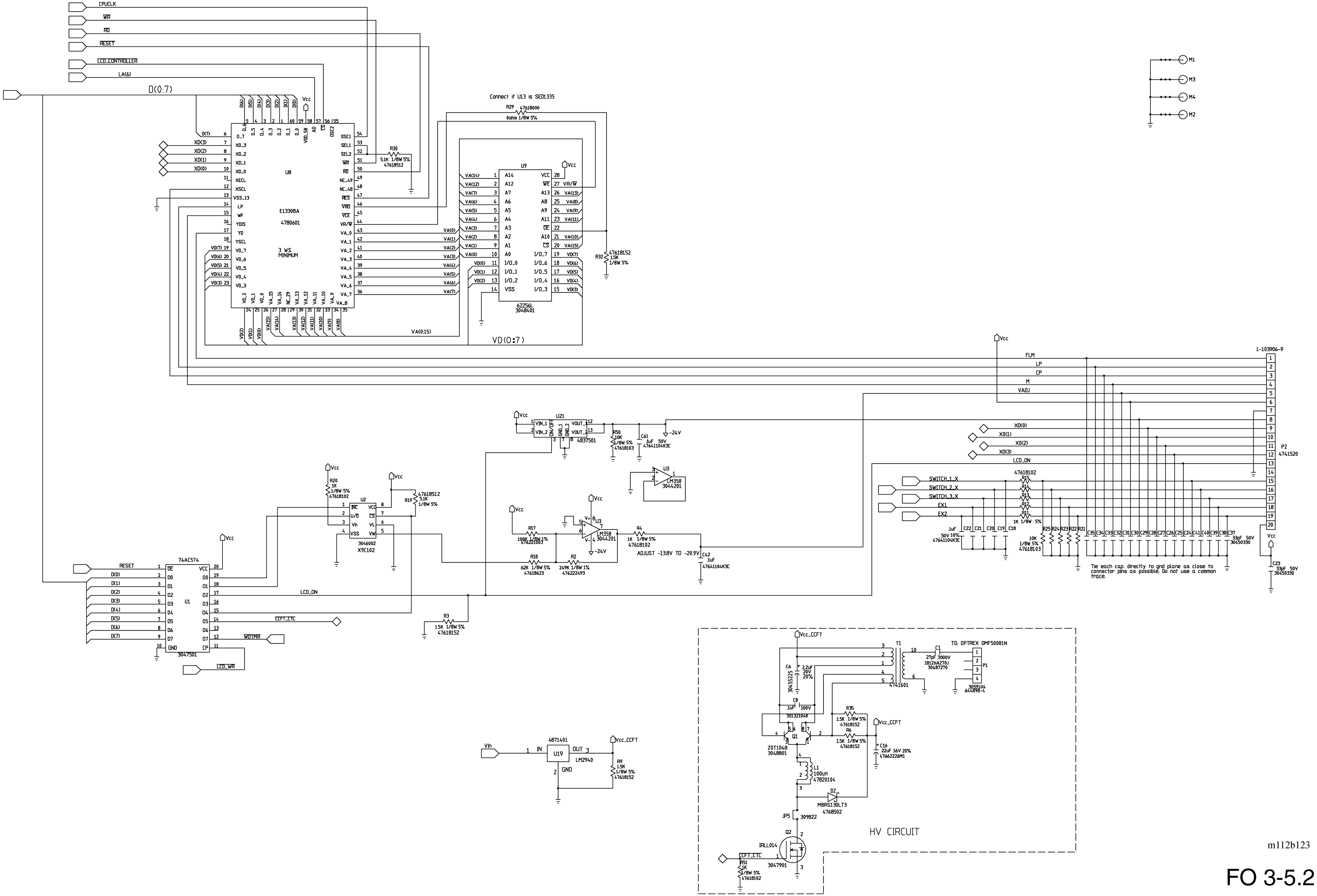

P2
P3
P4
P5
641215-5
4841905
-RLY_REF
+RLY_REF
NEG0
POS0
NEG1
POS1
NEG2
POS2
NEG3
POS3
PGND
+5VA
-5VA
Ferrite Bead
4787601
L5
L6
U2
3047001
74HC4052
X0
X1
X2
X3
Y0
Y1
Y2
Y3
INH
VCC
VEE
GND
AGND
AIN+
AIN-
AD_REF+
AD_REF-
U3
CS5516
4771001
VA+
VD+
MDRV+
MDRV-
SMODE
BX1
BX2
SDO
SID
SCLK
GRDY
CS
RST
VREF+
VREF-
AGND1
AGND2
DGND
XOUT
XIN
VA-
VD-
+5VD
Y2
4MHz
3052101
X1
X2
ID(10)
ID(9)
ID(8)
ID(4)
ID(7)
ID(3)
R12
R14
47618103
VCC
VBB
SMD050
4048602
R23
L2
L3
D2
SA18
47681180
C41
C44
C13
U5
LM2940CS-5.0
4871401
IN
OUT
GND
5V
C12
C14
C18
L1
47877103
10uH
U1
LM2940CS-5.0
4871401
+5VA
U7
3047101
LT1054CS
NC
FB
C+
C-
OSC
REF
OUT
V+
C24
C27
C28
L4
47877103
10uH
U6
LM2990CS-5.0
3048501
-5VA
-5V
NEURON I/O TEST PORT
P6
1-173981-2
4836212
ID(0)
ID(1)
ID(2)
ID(3)
ID(4)
ID(5)
ID(6)
ID(7)
ID(8)
ID(9)
ID(10)
C61
C47
C53
C54
C49
C62
C51
C55
C56
C50
C63
C52
C58
C57
C46
C64
C48
C59
C60
C45
XSIG010457
XSIG010458
XSIG010453
XSIG010454
XSIG010452
XSIG010451
XSIG010455
XSIG010456
P1
4842008
175487-8
U8
4770075176
RO
RE
DE
DI
LONB
LONA
CP0
CP1
CP2
D4
D5
SA5.0
47681050
C40
R24
10K
1/8W 5%
47618103
U11
3045901
X25040S
CS
SO
WP
VSS
VCC
HOLD
SCK
SI
R22
R26
U9
478003150
MC143150B1
A(15)
A(0:15)
D(0:7)
NC_48
NC_49
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
CP4
CP3
CP2
CP1
CP0
NC_27
VDD_26
VSS_25
CLK1
CLK2
VDD_22
VSS_21
VDD_20
VSS_19
NC_18
SER
C31
C33
C34
C35
C36
C38
C39
R25
R27
100K
R30
Y1
10MHz
3052103
U10
AM27C256-90
45795256090
VPP
VCC
/OE
/CE
D1
4792001
RED
R29
1K
47618102
U12
477131233Z10
DS1233Z-10
RST
C37
C43
U13
4836401
M1
M2
M3
M4
Mounting Holes
DGND

m112b121

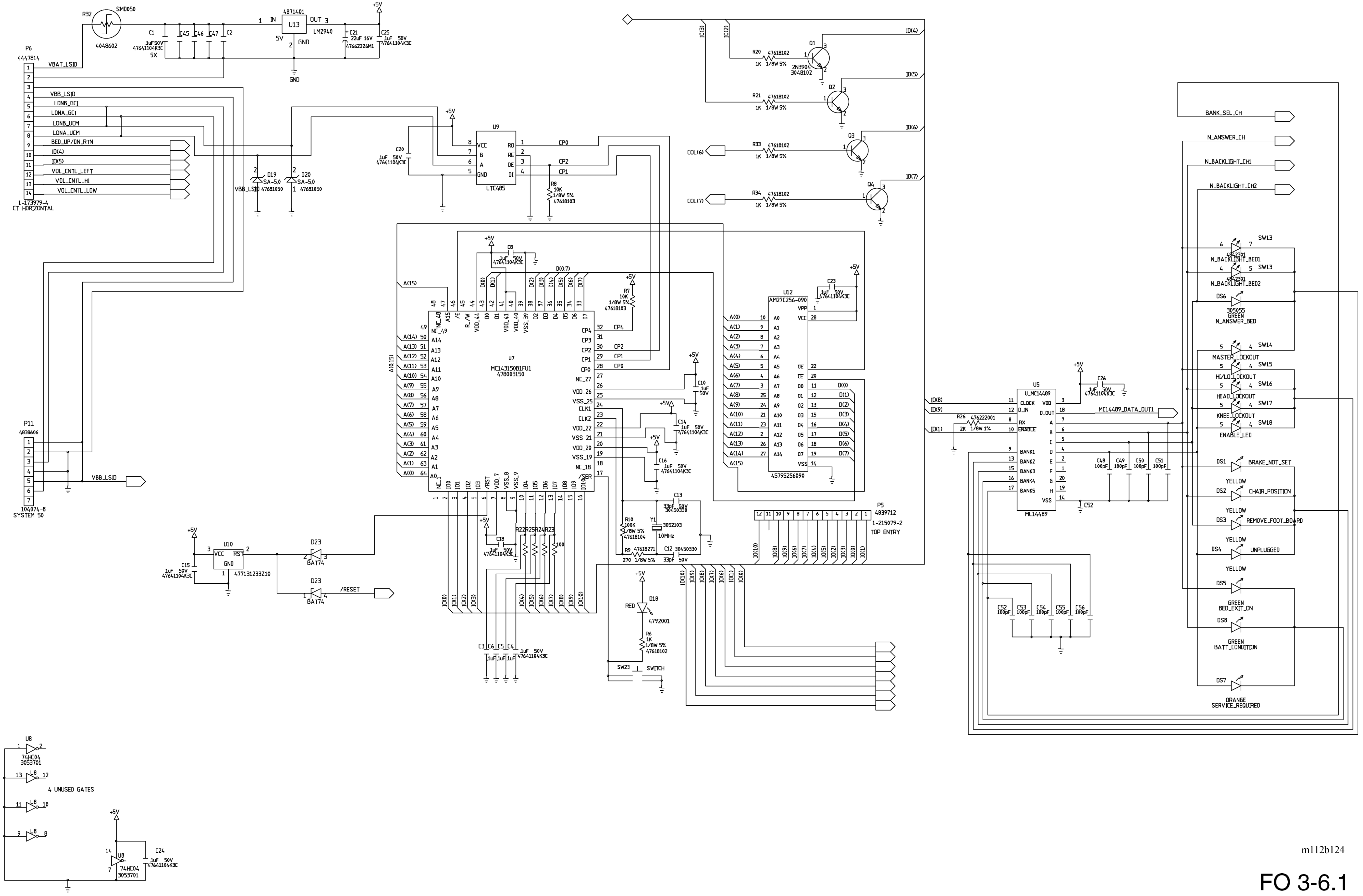
P.C. Board Wiring Diagram—Graphical Caregiver Interface (GCI)® Control (P/N 47035) Sheet 1 of 2


A(8:19)
PROGRAM BEFORE INSTALLATION
U13
PALCE16V8H-7
4333012
20MHZ
RD
WR
SWITCH_CS
LCD_REG
NEURON_SEL
LA(19)
DEN
WAIT_EN
SRDY
SWITCH_RD
NEURON_CS
LCD_WR
RESET
CPUCLK
JP2
309822
U14
80C188
47B0101
Y1
40MHz
4777501
L2
3.3uH
4776401
NEURON I/O TEST PORT
P3
4836212
1-173981-2
U5
478003150
REQUIRES MC143150B1FU OR NEWER VERSION
1 WS MINIMUM
U10
AM27C256-090
45795256090
EA(0:15)
ED(0:7)
AD(0:7)
U6
DS75176BM
4770075176
CPUCLK
U22
3047401
74AC573
U11
3047401
74AC573
U15
3047401
74AC573
ALE
U18
M48T58
1 WS MINIMUM
4771101
U12
HM628128
4771201
1 WS MINIMUM
LA(0:19)
U16
AM29F040
4780201
0 WS MINIMUM
U7
3078401
LA19
U17
74ACT245
3047301
DT/R
RESET
JP3
For external reset
JP4
309822
U23
MAX705
3044401
WDTMR
D(0:7)
U4
74ACT245
3047301
SWITCH_RD
SWITCH_1_X
SWITCH_2_X
SWITCH_3_X
EX1
EX2
NEURON_CS
NEURON_RW
LA(0)
SERVICE
D6
4792001
SW1
SWITCH
4836401
D1
BAT85
48411BAT85
JP1
309822
RESET_2930
SM0100
4048603
L3
Ferrite Bead
4787601
U20
LM2940
4871401
Vin
Vcc
5V
C14
2.2uF 20V
C62
150uF 10V
D3
47681180
D7
MBRS130LT3
4768502
SYS50
104074-8
P6
VBB
GND
LONB
LONA
4838606
D5
47681050
D4
47681050
RAM_CS
LCD_CONTROLLER
LCD_REG
SWITCH_CS
NEURON_SEL
DEN
RTC_CS
m112b122

P.C. Board Wiring Diagram—Graphical Caregiver Interface (GCI)® Control (P/N 47035) Sheet 2 of 2

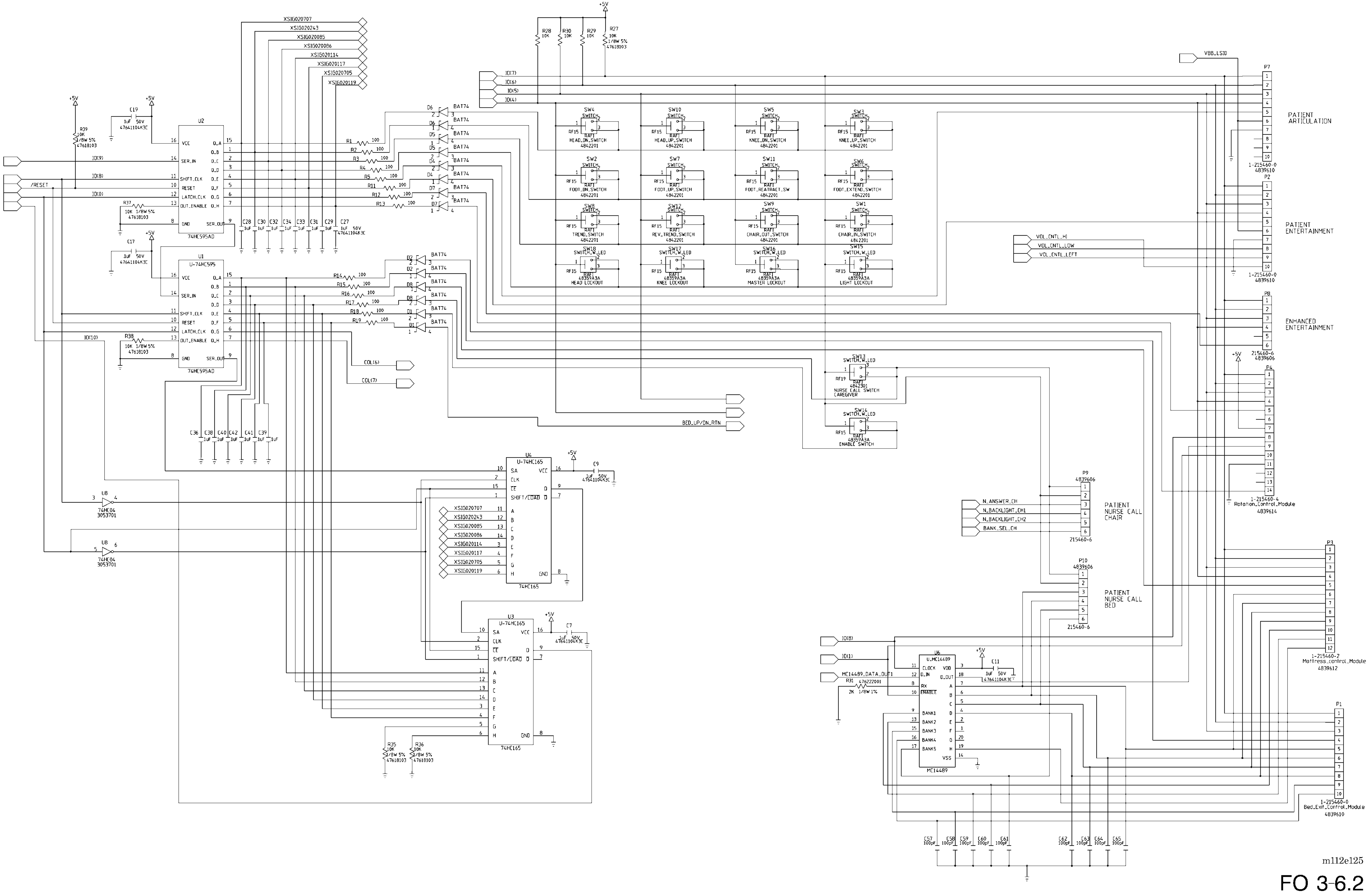

CPUCLK
WR
RD
RESET
LCD_CONTROLLER
LA(6)
D(0:7)
U8
E1330BA
4780601
3 WS MINIMUM
Connect if U13 is SED1335
R29 47618000
0ohm 1/8W 5%
R30 5.1K 1/8W 5% 47618512
U9
62256L
3048401
R32 47618152 1.5K 1/8W 5%
VA(0:15)
VD(0:7)
Vcc
M1
M3
M4
M2
1-103906-9
FLM
LP
CP
M
VADJ
XD(0)
XD(1)
XD(2)
XD(3)
LCD_ON
SWITCH_1_X
SWITCH_2_X
SWITCH_3_X
EX1
EX2
P2
4741520
47618102
R15
R14
R13
R12
R11
1K 1/8W 5%
.1uF 50V 10% 47641104K3C
10K 1/8W 5% 47618103
33pF 50V 30450330
C23 33pF 50V 30450330
Tie each cap. directly to gnd plane as close to connector pins as possible. Do not use a common trace.
U21
4837501
R50 10K 1/8W 5% 47618103
C61 .1uF 50V 47641104K3C
-24V
U3
LM358
3044201
R20 1K 1/8W 5% 47618102
U2
3046002
X9C102
R19 47618512 5.1K 1/8W 5%
R17 100K 1/8W 1% 47622003
R18 62K 1/8W 5% 47618623
R2 249K 1/8W 1% 476222493
R4 1K 1/8W 5% 47618102
ADJUST -13.8V TO -20.9V
C42 .1uF 47641104K3C
RESET
74AC574
U1
3047501
CCFT_CTL
WDTMR
LCD_WR
R3 1.5K 1/8W 5% 47618152
Vin
4871401
U19
LM2940
Vcc_CCFT
R9 1.5K 1/8W 5% 47618152
T1
TO: OPTREX DMF50081N
C1 27pF 3000V 1812HA270J 30487270
P1
3059104 644898-4
4741601
C6 2.2uF 20V 20% 3045225
C8 .1uF 100V 30132104K
R35 1.5K 1/8W 5% 47618152
R6 1.5K 1/8W 5% 47618152
C16 22uF 16V 20% 47662226M1
Q1
ZDT1048 3048801
L1 100uH 47820104
D2 MBRS130LT3 4768502
JP5 309822
Q2
IRLL014
3047901
R51 1K 1/8W 5% 47618102
HV CIRCUIT
m112b123

P.C. Board Wiring Diagram—UCM Right Caregiver (P/N 47357) Sheet 1 of 2


R32
SMD050
4048602
P6
4447814
VBAT_LSID
VBB_LSID
LONB_GCI
LONA_GCI
LONB_UCM
LONA_UCM
BED_UP/DN_RTN
ID(4)
ID(5)
VOL_CNTL_LEFT
VOL_CNTL_HI
VOL_CNTL_LOW
1-173979-4
CT HORIZONTAL
C1
C45
C46
C47
C2
1uF 50V
47641104K3C
5X
U13
4871401
IN
OUT
GND
LM2940
5V
C21
22uF 16V
47662226M1
C25
1uF 50V
47641104K3C
+5V
GND
U9
LTC485
VCC
B
A
GND
RO
RE
DE
DI
CP0
CP2
CP1
C20
R8
10K
1/8W 5%
47618103
D19
D20
SA-5.0
47681050
R20
R21
R33
R34
47618102
1K 1/8W 5%
Q1
Q2
Q3
Q4
2N3904
3048102
COL(6)
COL(7)
ID(2)
ID(3)
ID(6)
ID(7)
U7
MC143150B1FU1
478003150
A(15)
A(0:15)
D(0:7)
C8
R7
10K
1/8W 5%
47618103
U12
AM27C256-090
45795256090
C23
C10
C14
C16
C13
C12
Y1
3052103
10MHz
30450330
33pF 50V
R9
47618271
270 1/8W 5%
R10
100K
1/8W 5%
47618104
P11
4838606
104074-8
SYSTEM 50
VBB_LSID
U10
477131233Z10
VCC
RST
GND
C15
D23
BAT74
/RESET
R22 R25 R24 R23
100
C18
C3 C6 C5 C4
1uF 50V
47641104K3C
D18
RED
4792001
R6
1K
1/8W 5%
47618102
SW23
SWITCH
P5
4839712
1-215079-2
TOP ENTRY
U5
U_MC14489
MC14489
CLOCK
D_IN
RX
ENABLE
BANK1
BANK2
BANK3
BANK4
BANK5
VDD
D_OUT
VSS
R26
476222001
2K 1/8W 1%
C26
MC14489_DATA_OUT1
C48 C49 C50 C51
100pF
C52
C53 C54 C55 C56
BANK_SEL_CH
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
SW13
4842301
N_BACKLIGHT_BED1
N_BACKLIGHT_BED2
DS6
305055
GREEN
N_ANSWER_BED
SW14
MASTER_LOCKOUT
SW15
HI/LO_LOCKOUT
SW16
HEAD_LOCKOUT
SW17
KNEE_LOCKOUT
SW18
ENABLE_LED
DS1
BRAKE_NOT_SET
YELLOW
DS2
CHAIR_POSITION
DS3
REMOVE_FOOT_BOARD
DS4
UNPLUGGED
DS5
BED_EXIT_ON
DS8
BATT_CONDITION
DS7
ORANGE
SERVICE_REQUIRED
U8
74HC04
3053701
4 UNUSED GATES
C24

m112b124

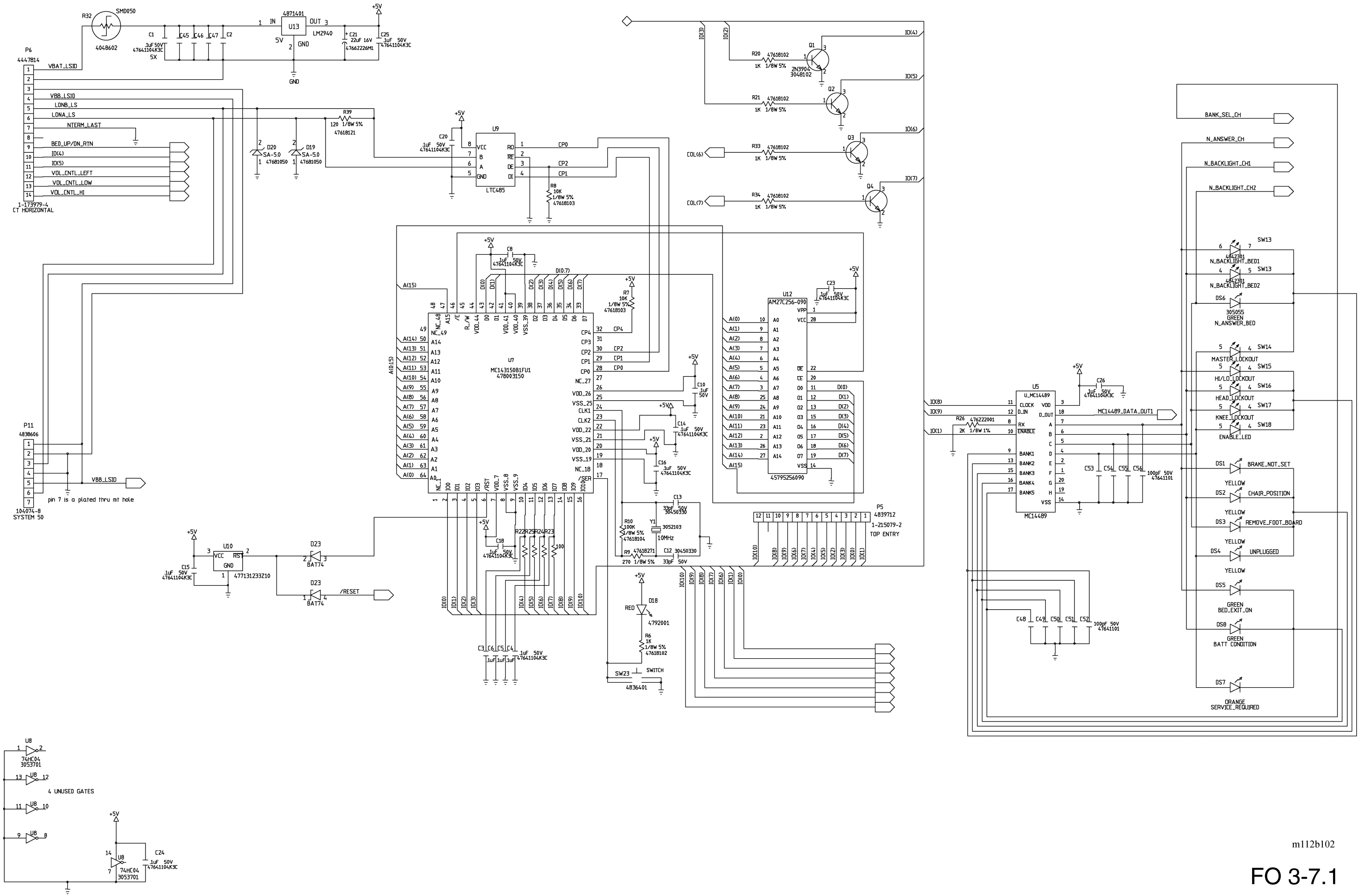
P.C. Board Wiring Diagram—UCM Right Caregiver (P/N 47357) Sheet 2 of 2



+5V
XSIG020707
XSIG020243
XSIG020085
XSIG020086
XSIG020114
XSIG020117
XSIG020705
XSIG020119
R28 10K
R30 10K
R29 10K
R27 10K 1/8W 5% 47618103
IO(7)
IO(6)
IO(5)
IO(4)
VBB_LSID
P7
PATIENT ARTICULATION
1-215460-0 4839610
P2
PATIENT ENTERTAINMENT
1-215460-0 4839610
P8
ENHANCED ENTERTAINMENT
215460-6 4839606
P4
1-215460-4 Rotation_Control_Module 4839614
U2
74HC595AD
U1
U-74HC595
74HC595AD
VCC
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
GND
SER_OUT
IO(9)
IO(8)
IO(0)
IO(10)
/RESET
R39 10K 1/8W 5% 47618103
C19 1uF 50V 47641104K3C
C17 1uF 50V 47641104K3C
R37 10K 1/8W 5% 47618103
R38 10K 1/8W 5% 47618103
C28 C30 C32 C34 C33 C31 C29 C27
1uF 50V 47641104K3C
D6 D5 D4 D7 D2 D3 D1
BAT74
R1 R2 R3 R4 R5 R11 R12 R13
R14 R15 R16 R17 R18 R19
100
SW4 SWITCH RF15 RAFI HEAD_DN_SWITCH 4842201
SW10 SWITCH RF15 RAFI HEAD_UP_SWITCH 4842201
SW5 SWITCH RF15 RAFI KNEE_DN_SWITCH 4842201
SW3 SWITCH RF15 RAFI KNEE_UP_SWITCH 4842201
SW2 SWITCH RF15 RAFI FOOT_DN_SWITCH 4842201
SW7 SWITCH RF15 RAFI FOOT_UP_SWITCH 4842201
SW11 SWITCH RF15 RAFI FOOT_RETRACT_SW 4842201
SW6 SWITCH RF15 RAFI FOOT_EXTEND_SWITCH 4842201
SW8 SWITCH RF15 RAFI TREND_SWITCH 4842201
SW12 SWITCH RF15 RAFI REV_TREND_SWITCH 4842201
SW9 SWITCH RF15 RAFI CHAIR_OUT_SWITCH 4842201
SW1 SWITCH RF15 RAFI CHAIR_IN_SWITCH 4842201
SW18 SWITCH_W_LED RF15 RAFI 48359A3A HEAD LOCKOUT
SW17 SWITCH_W_LED RF15 RAFI 48359A3A KNEE LOCKOUT
SW16 SWITCH_W_LED RF15 RAFI 48359A3A MASTER LOCKOUT
SW15 SWITCH_W_LED RF15 RAFI 48359A3A LIGHT LOCKOUT
SW13 SWITCH_W_LED RF19 RAFI 4842301 NURSE CALL SWITCH CAREGIVER
SW14 SWITCH_W_LED RF15 RAFI 48359A3A ENABLE SWITCH
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
COL(6)
COL(7)
BED_UP/DN_RTN
C36 C38 C40 C42 C41 C39 1uF
U8 74HC04 3053701
U4 U-74HC165 74HC165
SA CLK CE SHIFT/LOAD VCC D A B C D E F G H GND
C9 1uF 50V 47641104K3C
U3 U-74HC165 74HC165
C7 1uF 50V 47641104K3C
R35 10K 1/8W 5% 47618103
R36 10K 1/8W 5% 47618103
P9 4839606
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
BANK_SEL_CH
PATIENT NURSE CALL CHAIR
215460-6
P10 4839606
PATIENT NURSE CALL BED
215460-6
P3
1-215460-2 Mattress_control_Module 4839612
IO(8)
IO(1)
MC14489_DATA_OUT1
R31 476222001 2K 1/8W 1%
U6 U_MC14489 MC14489
CLOCK D_IN RX ENABLE BANK1 BANK2 BANK3 BANK4 BANK5 VDD D_OUT VSS
C11 1uF 50V 47641104K3C
P1
1-215460-0 Bed_Exit_Control_Module 4839610
C57 C58 C59 C60 C61 C62 C63 C64 C65 100pF

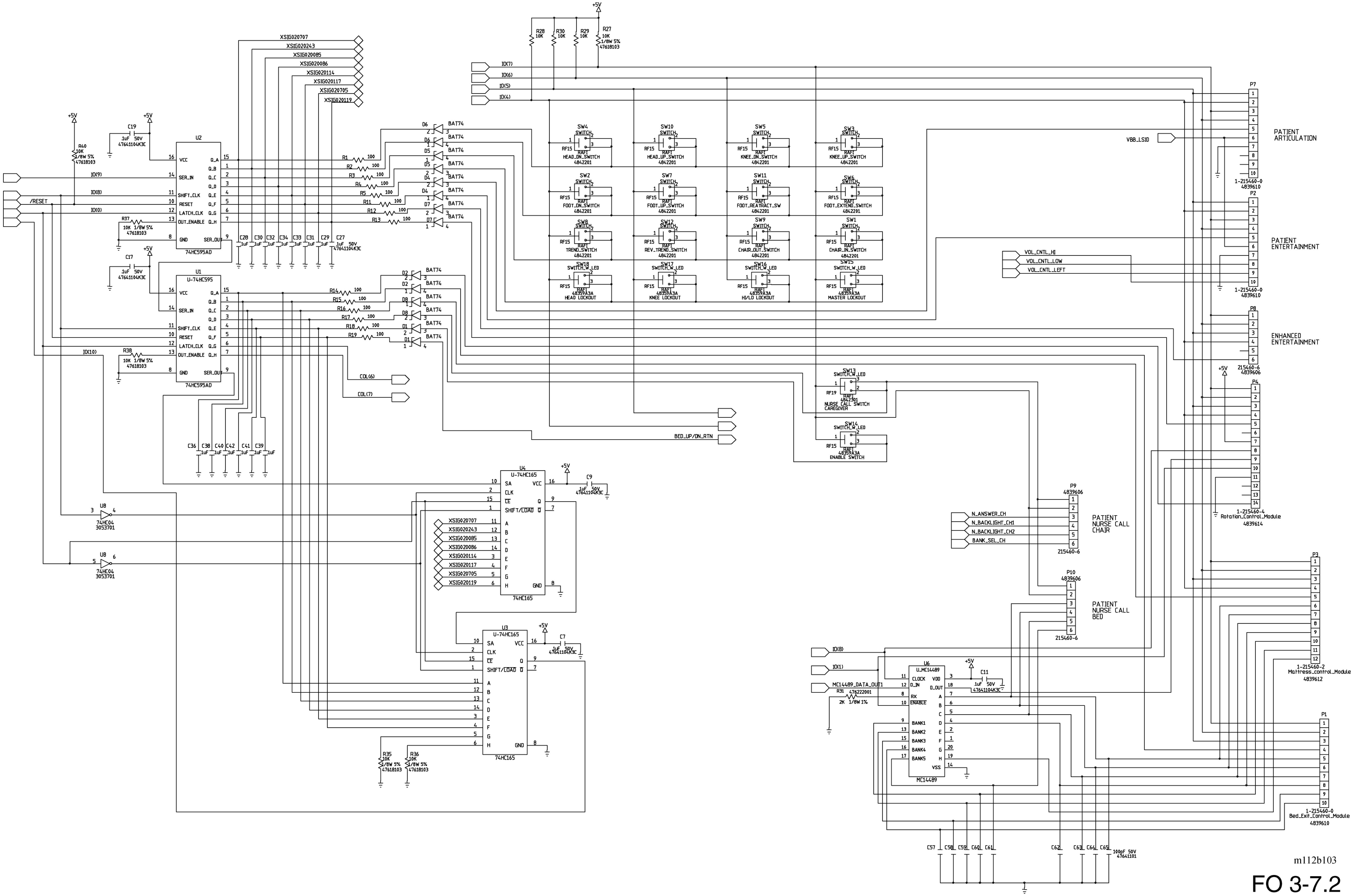
m112e125

P.C. Board Wiring Diagram—UCM Left Caregiver (P/N 47360) Sheet 1 of 2

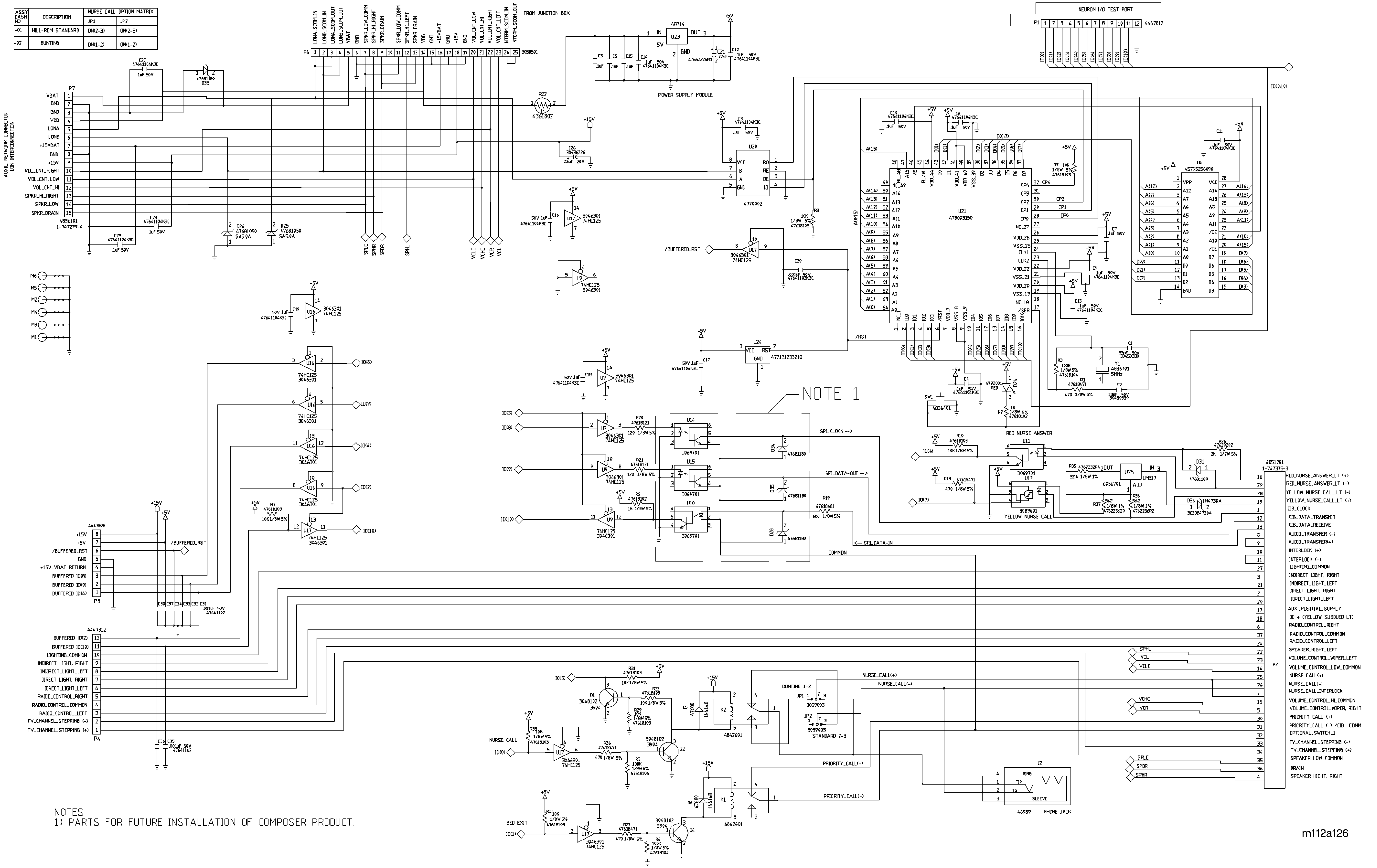

R32
SMD050
4048602
P6
4447814
VBAT_LSID
VBB_LSID
LONB_LS
LONA_LS
NTERM_LAST
BED_UP/DN_RTN
IO(4)
IO(5)
VOL_CNTL_LEFT
VOL_CNTL_LOW
VOL_CNTL_HI
1-173979-4
CT HORIZONTAL
U13
4871401
LM2940
IN
OUT
GND
5V
+5V
C1
C45
C46
C47
C2
.1uF 50V
47641104K3C
5X
C21
22uF 16V
47662226M1
C25
.1uF 50V
47641104K3C
GND
R39
120 1/8W 5%
47618121
D20
SA-5.0
47681050
D19
SA-5.0
47681050
U9
LTC485
C20
.1uF 50V
47641104K3C
VCC
B
A
GND
RO
RE
DE
DI
CP0
CP2
CP1
R8
10K
1/8W 5%
47618103
Q1
2N3904
3048102
Q2
Q3
Q4
R20
R21
R33
R34
47618102
1K 1/8W 5%
COL(6)
COL(7)
IO(4)
IO(5)
IO(6)
IO(7)
IO(3)
IO(2)
BANK_SEL_CH
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
U7
MC143150B1FU1
478003150
C8
.1uF 50V
47641104K3C
D(0:7)
A(15)
A(0:15)
R7
10K
1/8W 5%
47618103
U12
AM27C256-090
45795256090
C23
.1uF 50V
47641104K3C
C10
.1uF
50V
C14
.1uF 50V
47641104K3C
C16
.1uF 50V
47641104K3C
C13
33pF 50V
30450330
Y1
3052103
10MHz
C12 30450330
33pF 50V
R10
100K
1/8W 5%
47618104
R9 47618271
270 1/8W 5%
P5
4839712
1-215079-2
TOP ENTRY
P11
4838606
VBB_LSID
pin 7 is a plated thru mt hole
104074-8
SYSTEM 50
U10
477131233Z10
VCC
RST
GND
C15
.1uF 50V
47641104K3C
D23
BAT74
/RESET
C18
.1uF 50V
47641104K3C
R22
R25
R24
R23
100
C3
C6
C5
C4
.1uF 50V
47641104K3C
D18
RED
4792001
R6
1K
1/8W 5%
47618102
SW23
SWITCH
4836401
U5
MC14489
U_MC14489
CLOCK
D_IN
ENABLE
RX
D_OUT
VDD
VSS
BANK1
BANK2
BANK3
BANK4
BANK5
C26
.1uF 50V
47641104K3C
MC14489_DATA_OUT1
R26 476222001
2K 1/8W 1%
IO(8)
IO(9)
IO(1)
C53
C54
C55
C56
100pF 50V
47641101
C48
C49
C50
C51
C52
100pF 50V
47641101
SW13
4842301
N_BACKLIGHT_BED1
N_BACKLIGHT_BED2
DS6
305055
GREEN
N_ANSWER_BED
SW14
MASTER_LOCKOUT
SW15
HI/LO_LOCKOUT
SW16
HEAD_LOCKOUT
SW17
KNEE_LOCKOUT
SW18
ENABLE_LED
DS1
BRAKE_NOT_SET
YELLOW
DS2
CHAIR_POSITION
DS3
REMOVE_FOOT_BOARD
DS4
UNPLUGGED
DS5
GREEN
BED_EXIT_ON
DS8
BATT CONDITION
DS7
ORANGE
SERVICE_REQUIRED
U8
74HC04
3053701
4 UNUSED GATES
C24
.1uF 50V
47641104K3C

m112b102

P.C. Board Wiring Diagram—UCM Left Caregiver (P/N 47360) Sheet 2 of 2


+5V
R28 10K
R30 10K
R29 10K
R27 10K 1/8W 5% 47618103
XSIG020707
XSIG020243
XSIG020085
XSIG020086
XSIG020114
XSIG020117
XSIG020705
XSIG020119
IO(7)
IO(6)
IO(5)
IO(4)
IO(9)
IO(8)
/RESET
IO(0)
IO(10)
C19 1uF 50V 47641104K3C
R40 10K 1/8W 5% 47618103
U2
74HC595AD
VCC
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
GND
SER_OUT
Q_A
Q_B
Q_C
Q_D
Q_E
Q_F
Q_G
Q_H
R37 10K 1/8W 5% 47618103
C17 .1uF 50V 47641104K3C
U1
U-74HC595
R38 10K 1/8W 5% 47618103
R1 100
R2 100
R3 100
R4 100
R5 100
R11 100
R12 100
R13 100
R14 100
R15 100
R16 100
R17 100
R18 100
R19 100
D6 BAT74
D5 BAT74
D4 BAT74
D7 BAT74
D2 BAT74
D8 BAT74
D1 BAT74
C28 C30 C32 C34 C33 C31 C29 C27 .1uF 50V 47641104K3C
COL(6)
COL(7)
C36 C38 C40 C42 C41 C39 .1uF
SW4 SWITCH RF15 RAFI HEAD_DN_SWITCH 4842201
SW10 SWITCH RF15 RAFI HEAD_UP_SWITCH 4842201
SW5 SWITCH RF15 RAFI KNEE_DN_SWITCH 4842201
SW3 SWITCH RF15 RAFI KNEE_UP_SWITCH 4842201
SW2 SWITCH RF15 RAFI FOOT_DN_SWITCH 4842201
SW7 SWITCH RF15 RAFI FOOT_UP_SWITCH 4842201
SW11 SWITCH RF15 RAFI FOOT_RETRACT_SW 4842201
SW6 SWITCH RF15 RAFI FOOT_EXTEND_SWITCH 4842201
SW8 SWITCH RF15 RAFI TREND_SWITCH 4842201
SW12 SWITCH RF15 RAFI REV_TREND_SWITCH 4842201
SW9 SWITCH RF15 RAFI CHAIR_OUT_SWITCH 4842201
SW1 SWITCH RF15 RAFI CHAIR_IN_SWITCH 4842201
SW18 SWITCH_W_LED RF15 RAFI 48359A3A HEAD LOCKOUT
SW17 SWITCH_W_LED RF15 RAFI 48359A3A KNEE LOCKOUT
SW16 SWITCH_W_LED RF15 RAFI 48359A3A HI/LO LOCKOUT
SW15 SWITCH_W_LED RF15 RAFI 48359A3A MASTER LOCKOUT
SW13 SWITCH_W_LED RF19 RAFI 4842301 NURSE CALL SWITCH CAREGIVER
SW14 SWITCH_W_LED RF15 RAFI 48359A3A ENABLE SWITCH
BED_UP/DN_RTN
VBB_LSID
P7
PATIENT ARTICULATION
1-215460-0 4839610
P2
PATIENT ENTERTAINMENT
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
1-215460-0 4839610
P8
ENHANCED ENTERTAINMENT
215460-6 4839606
P4
1-215460-4 Rotation_Control_Module 4839614
U8 74HC04 3053701
U4
U-74HC165
74HC165
SA
CLK
CE
SHIFT/LOAD
VCC
Q
GND
C9 .1uF 50V 47641104K3C
U3
U-74HC165
74HC165
C7 .1uF 50V 47641104K3C
R35 10K 1/8W 5% 47618103
R36 10K 1/8W 5% 47618103
P9 4839606
PATIENT NURSE CALL CHAIR
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
BANK_SEL_CH
215460-6
P10 4839606
PATIENT NURSE CALL BED
215460-6
P3
1-215460-2 Mattress_control_Module 4839612
IO(8)
IO(1)
MC14489_DATA_OUT1
R31 47622001 2K 1/8W 1%
U6
U_MC14489
MC14489
CLOCK
D_IN
RX
ENABLE
BANK1
BANK2
BANK3
BANK4
BANK5
VDD
D_OUT
VSS
C11 .1uF 50V 47641104K3C
P1
1-215460-0 Bed_Exit_Control_Module 4839610
C57 C58 C59 C60 C61 C62 C63 C64 C65 100pF 50V 47641101
m112b103

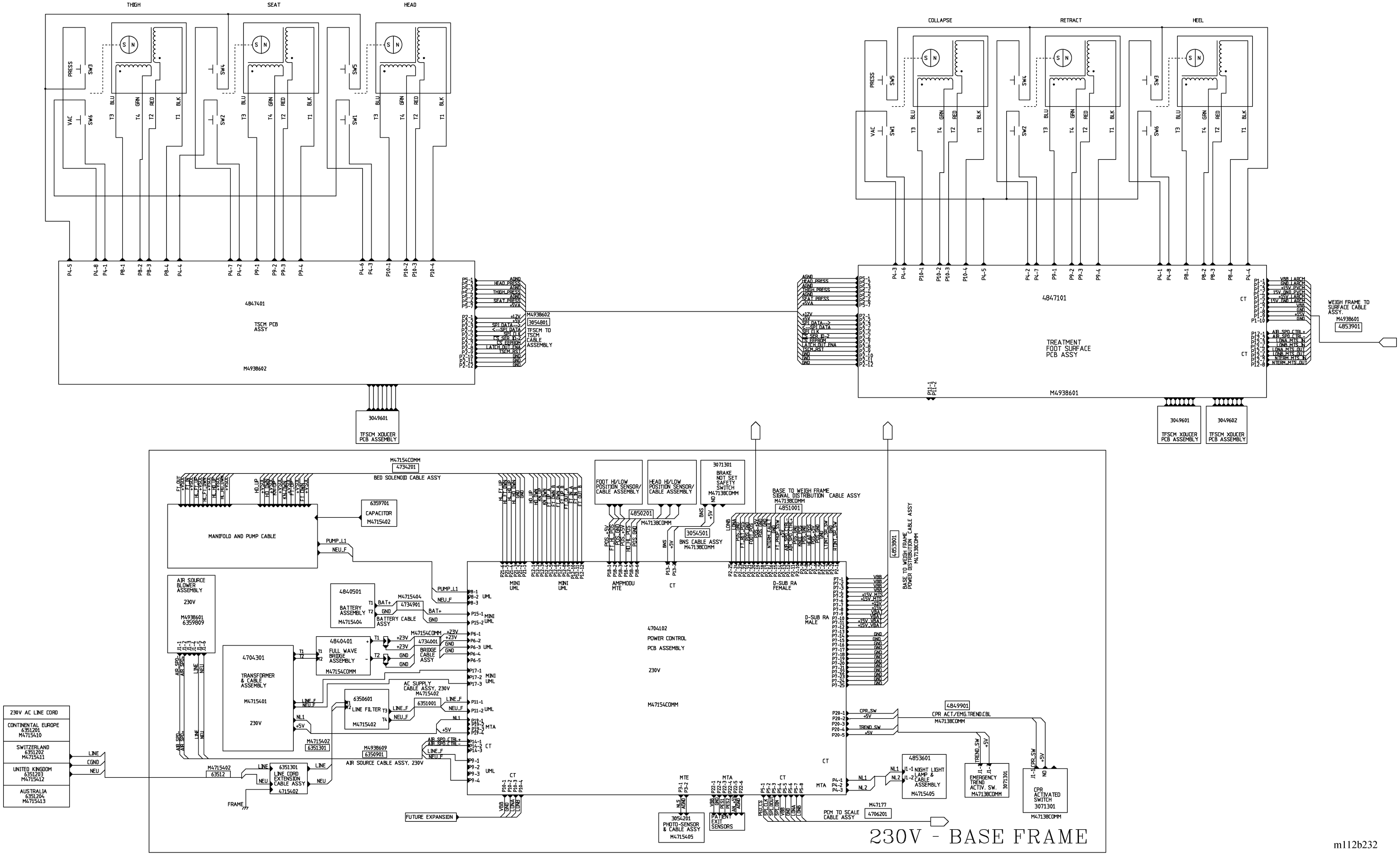
P.C. Board Wiring Diagram—SideCom® Communication System (P/N 47376)


ASSY DASH NO.
DESCRIPTION
NURSE CALL OPTION MATRIX
JP1
JP2
-01 HILL-ROM STANDARD ON(2-3) ON(2-3)
-02 BUNTING ON(1-2) ON(1-2)
FROM JUNCTION BOX
POWER SUPPLY MODULE
NEURON I/O TEST PORT
AUX/L NETWORK CONNECTOR
LON INTERCONNECTION
VBAT
GND
VBB
LONA
LONB
+15VBAT
+15V
VOL_CNT_RIGHT
VOL_CNT_LOW
VOL_CNT_HI
SPKR_HI_RIGHT
SPKR_LOW
SPKR_DRAIN
/BUFFERED_RST
/RST
SPI_CLOCK -->
SPI_DATA_OUT -->
<-- SPI_DATA_IN
COMMON
NOTE 1
RED NURSE ANSWER
YELLOW NURSE CALL
NURSE CALL
BED EXIT
NURSE_CALL(+)
NURSE_CALL(-)
PRIORITY_CALL(+)
PRIORITY_CALL(-)
BUNTING 1-2
STANDARD 2-3
PHONE JACK
RING
TIP
SLEEVE
BUFFERED IO(8)
BUFFERED IO(9)
BUFFERED IO(4)
BUFFERED IO(2)
BUFFERED IO(10)
LIGHTING_COMMON
INDIRECT LIGHT, RIGHT
INDIRECT_LIGHT_LEFT
DIRECT LIGHT, RIGHT
DIRECT_LIGHT_LEFT
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
RADIO_CONTROL_LEFT
TV_CHANNEL_STEPPING (-)
TV_CHANNEL_STEPPING (+)
RED_NURSE_ANSWER_LT (+)
RED_NURSE_ANSWER_LT (-)
YELLOW_NURSE_CALL_LT (-)
YELLOW_NURSE_CALL_LT (+)
CIB_CLOCK
CIB_DATA_TRANSMIT
CIB_DATA_RECEIVE
AUDIO_TRANSFER (-)
AUDIO_TRANSFER(+)
INTERLOCK (+)
INTERLOCK (-)
AUX_POSITIVE_SUPPLY
DC + (YELLOW SUBDUED LT)
SPEAKER_HIGHT_LEFT
VOLUME_CONTROL_WIPER_LEFT
VOLUME_CONTROL_LOW_COMMON
NURSE_CALL_INTERLOCK
VOLUME_CONTROL_HI_COMMON
VOLUME_CONTROL_WIPER, RIGHT
PRIORITY CALL (+)
PRIORITY_CALL (-) /CIB COMM
OPTIONAL_SWITCH_1
SPEAKER_LOW_COMMON
DRAIN
SPEAKER HIGHT, RIGHT

NOTES:
1) PARTS FOR FUTURE INSTALLATION OF COMPOSER PRODUCT.

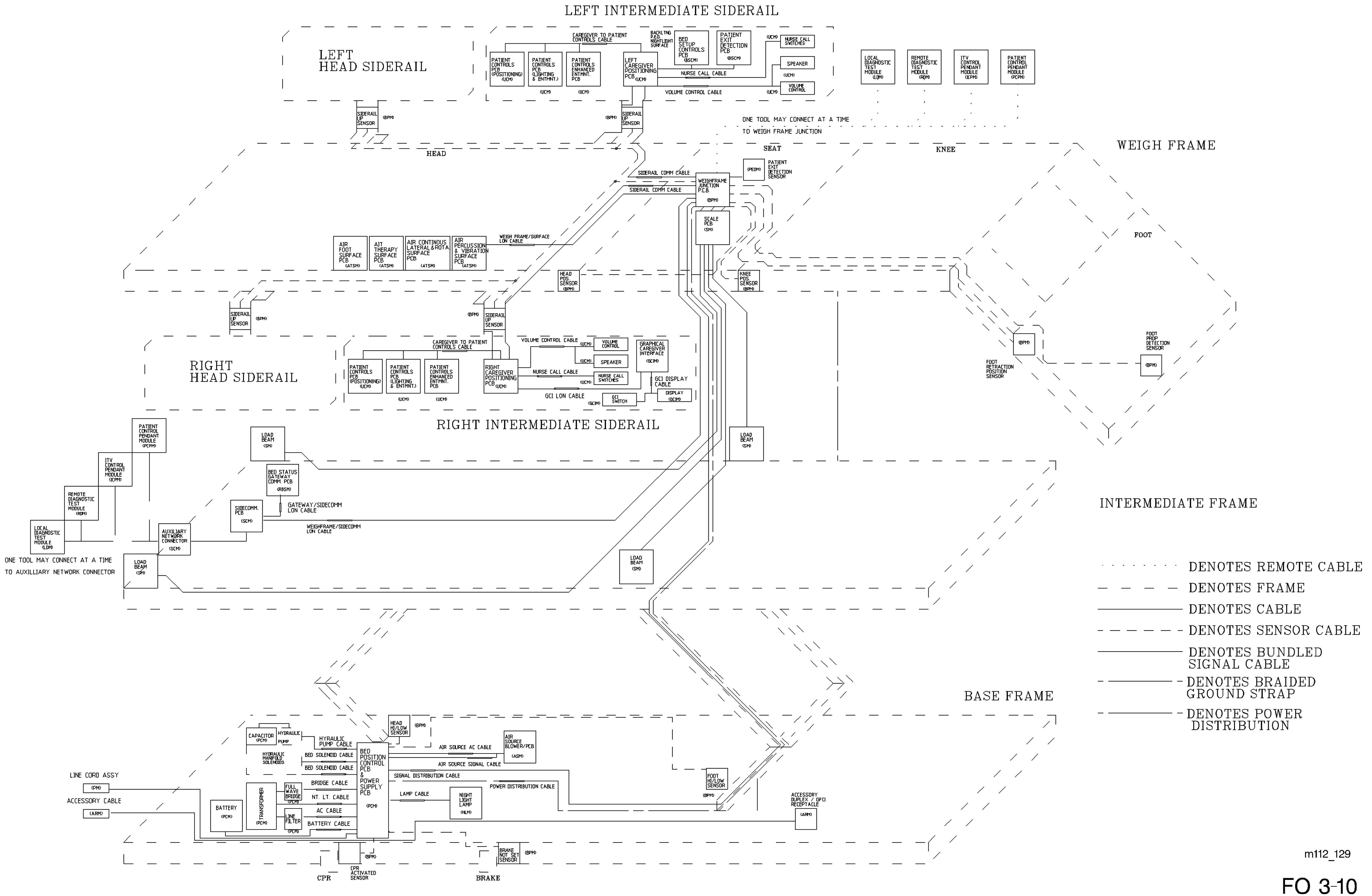
m112a126

System Wiring Diagram—TotalCare® Bed System—230V (P/N 47030)

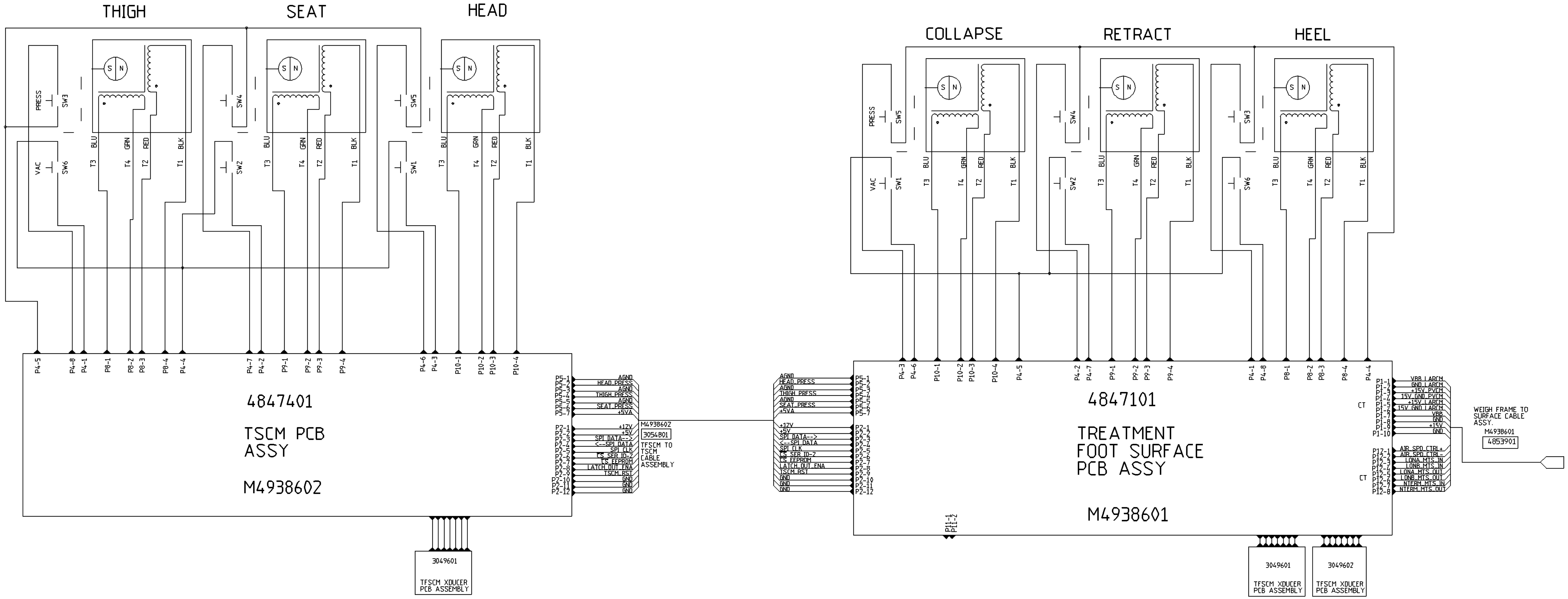

THIGH
SEAT
HEAD
PRESS
VAC
SW1
SW2
SW3
SW4
SW5
SW6
BLU
GRN
RED
BLK
T1
T2
T3
T4
4847401
TSCM PCB ASSY
M4938602
M4938602
3054801
TFSCM TO TSCM CABLE ASSEMBLY
3049601
TFSCM XDUCER PCB ASSEMBLY
COLLAPSE
RETRACT
HEEL
4847101
TREATMENT FOOT SURFACE PCB ASSY
M4938601
WEIGH FRAME TO SURFACE CABLE ASSY.
M4938601
4853901
3049601
TFSCM XDUCER PCB ASSEMBLY
3049602
TFSCM XDUCER PCB ASSEMBLY
M47154COMM
4734201
BED SOLENOID CABLE ASSY
MANIFOLD AND PUMP CABLE
6359701
CAPACITOR
M4715402
FOOT HI/LOW POSITION SENSOR/ CABLE ASSEMBLY
HEAD HI/LOW POSITION SENSOR/ CABLE ASSEMBLY
3071301
BRAKE NOT SET SAFETY SWITCH
M47138COMM
4850201
M47138COMM
3054501
BNS CABLE ASSY
M47138COMM
BASE TO WEIGH FRAME SIGNAL DISTRIBUTION CABLE ASSY
M47138COMM
4851001
4853901
BASE TO WEIGH FRAME POWER DISTRIBUTION CABLE ASSY
M47138COMM
AIR SOURCE BLOWER ASSEMBLY
230V
M4938601
6359809
4840501
BATTERY ASSEMBLY
M4715404
M4715404
4734901
BATTERY CABLE ASSY
4704301
TRANSFORMER & CABLE ASSEMBLY
M4715401
230V
4840401
FULL WAVE BRIDGE ASSEMBLY
M47154COMM
M47154COMM
4734001
BRIDGE CABLE ASSY
AC SUPPLY CABLE ASSY, 230V
M4715402
6350601
LINE FILTER
M4715402
6351001
M4715402
6351301
M4938609
6350901
AIR SOURCE CABLE ASSY, 230V
4704102
POWER CONTROL PCB ASSEMBLY
230V
M47154COMM
D-SUB RA FEMALE
D-SUB RA MALE
AMPMODU MTE
MINI UML
UML
MTA
CT
230V AC LINE CORD
CONTINENTAL EUROPE 6351201 M4715410
SWITZERLAND 6351202 M4715411
UNITED KINGDOM 6351203 M4715412
AUSTRALIA 6351204 M4715413
LINE
CGND
NEU
M4715402
63512
6351301
LINE CORD EXTENSION CABLE ASSY
4715402
FRAME
FUTURE EXPANSION
3054201
PHOTO-SENSOR & CABLE ASSY
M4715405
PATIENT EXIT SENSORS
M47177
4706201
PCM TO SCALE CABLE ASSY
4849901
CPR ACT/EMG.TREND.CBL
M47138COMM
4853601
NIGHT LIGHT LAMP & CABLE ASSEMBLY
M4715405
EMERGENCY TREND ACTIV. SW.
M47138COMM
3071301
CPR ACTIVATED SWITCH
3071301
M47138COMM
230V - BASE FRAME

m112b232

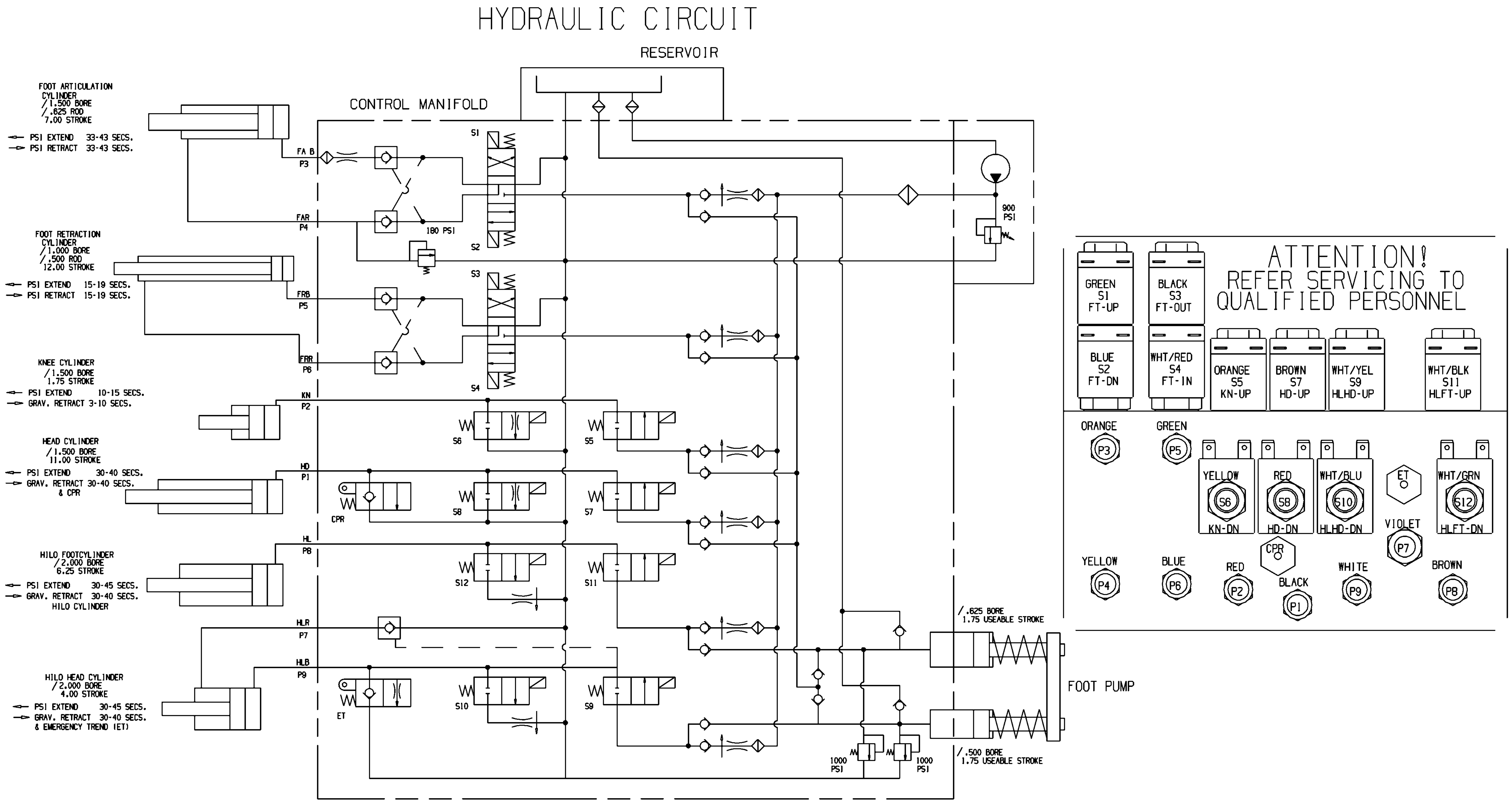
Bed Function Wiring Schematic Diagram


LEFT INTERMEDIATE SIDERAIL
LEFT HEAD SIDERAIL
CAREGIVER TO PATIENT CONTROLS CABLE
PATIENT CONTROLS PCB (POSITIONING) (UCM)
PATIENT CONTROLS PCB (LIGHTING & ENTMNT.) (UCM)
PATIENT CONTROLS ENHANCED ENTMNT. PCB (UCM)
LEFT CAREGIVER POSITIONING PCB (UCM)
BACKLTNG P.E.D. NIGHTLIGHT SURFACE
BED SETUP CONTROLS PCB (BSCM)
PATIENT EXIT DETECTION PCB (BSCM)
NURSE CALL CABLE
(UCM) NURSE CALL SWITCHES
SPEAKER (UCM)
VOLUME CONTROL CABLE
(UCM) VOLUME CONTROL
SIDERAIL UP SENSOR (BPM)
HEAD
ONE TOOL MAY CONNECT AT A TIME TO WEIGH FRAME JUNCTION
LOCAL DIAGNOSTIC TEST MODULE (LDM)
REMOTE DIAGNOSTIC TEST MODULE (RDM)
ITV CONTROL PENDANT MODULE (ICPM)
PATIENT CONTROL PENDANT MODULE (PCPM)
SEAT
KNEE
WEIGH FRAME
(PEDM) PATIENT EXIT DETECTION SENSOR
SIDERAIL COMM CABLE
SIDERAIL COMM CABLE
WEIGHFRAME JUNCTION P.C.B. (BPM)
SCALE PCB (SM)
FOOT
AIR FOOT SURFACE PCB (ATSM)
AIT THERAPY SURFACE PCB (ATSM)
AIR CONTINOUS LATERAL & ROTA. SURFACE PCB (ATSM)
AIR PERCUSSION & VIBRATION SURFACE PCB (ATSM)
WEIGH FRAME/SURFACE LON CABLE
HEAD POS. SENSOR (BPM)
KNEE POS. SENSOR (BPM)
SIDERAIL UP SENSOR (BPM)
SIDERAIL UP SENSOR (BPM)
FOOT RETRACTION POSITION SENSOR (BPM)
FOOT PROP DETECTION SENSOR (BPM)
RIGHT HEAD SIDERAIL
CAREGIVER TO PATIENT CONTROLS CABLE
PATIENT CONTROLS PCB (POSITIONING) (UCM)
PATIENT CONTROLS PCB (LIGHTING & ENTMNT.) (UCM)
PATIENT CONTROLS ENHANCED ENTMNT. PCB (UCM)
RIGHT CAREGIVER POSITIONING PCB (UCM)
VOLUME CONTROL CABLE
(UCM) VOLUME CONTROL
(UCM) SPEAKER
NURSE CALL CABLE
(UCM) NURSE CALL SWITCHES
GRAPHICAL CAREGIVER INTERFACE (GCIM)
GCI DISPLAY CABLE
DISPLAY (GCIM)
GCI LON CABLE
(GCIM) GCI SWITCH
RIGHT INTERMEDIATE SIDERAIL
PATIENT CONTROL PENDANT MODULE (PCPM)
ITV CONTROL PENDANT MODULE (ICPM)
REMOTE DIAGNOSTIC TEST MODULE (RDM)
LOCAL DIAGNOSTIC TEST MODULE (LDM)
ONE TOOL MAY CONNECT AT A TIME TO AUXILLIARY NETWORK CONNECTOR
AUXILIARY NETWORK CONNECTOR (SCM)
LOAD BEAM (SM)
LOAD BEAM (SM)
BED STATUS GATEWAY COMM. PCB (RBSM)
SIDECOMM. PCB (SCM)
GATEWAY/SIDECOMM LON CABLE
WEIGHFRAME/SIDECOMM LON CABLE
LOAD BEAM (SM)
LOAD BEAM (SM)
INTERMEDIATE FRAME
BASE FRAME
CAPACITOR (PCM)
HYDRAULIC PUMP
HYRAULIC PUMP CABLE
HYDRAULIC MANIFOLD SOLENOIDS
BED SOLENOID CABLE
BED SOLENOID CABLE
HEAD HI/LOW SENSOR (BPM)
BED POSITION CONTROL PCB & POWER SUPPLY PCB (PCM)
AIR SOURCE AC CABLE
AIR SOURCE SIGNAL CABLE
AIR SOURCE BLOWER/PCB (ASM)
SIGNAL DISTRIBUTION CABLE
POWER DISTRIBUTION CABLE
LAMP CABLE
NIGHT LIGHT LAMP (NLM)
FOOT HI/LOW SENSOR (BPM)
ACCESSORY DUPLEX / GFCI RECEPTACLE (ARM)
LINE CORD ASSY (PM)
ACCESSORY CABLE (ARM)
BATTERY (PCM)
TRANSFORMER (PCM)
FULL WAVE BRIDGE (PCM)
LINE FILTER (PCM)
BRIDGE CABLE
NT. LT. CABLE
AC CABLE
BATTERY CABLE
CPR ACTIVATED SENSOR (BPM)
CPR
BRAKE NOT SET SENSOR (BPM)
BRAKE
DENOTES REMOTE CABLE
DENOTES FRAME
DENOTES CABLE
DENOTES SENSOR CABLE
DENOTES BUNDLED SIGNAL CABLE
DENOTES BRAIDED GROUND STRAP
DENOTES POWER DISTRIBUTION
m112_129

P.C. Board Wiring Schematic Diagram—TFSCM (P/N 4847101) and TSCM (P/N 4847401)

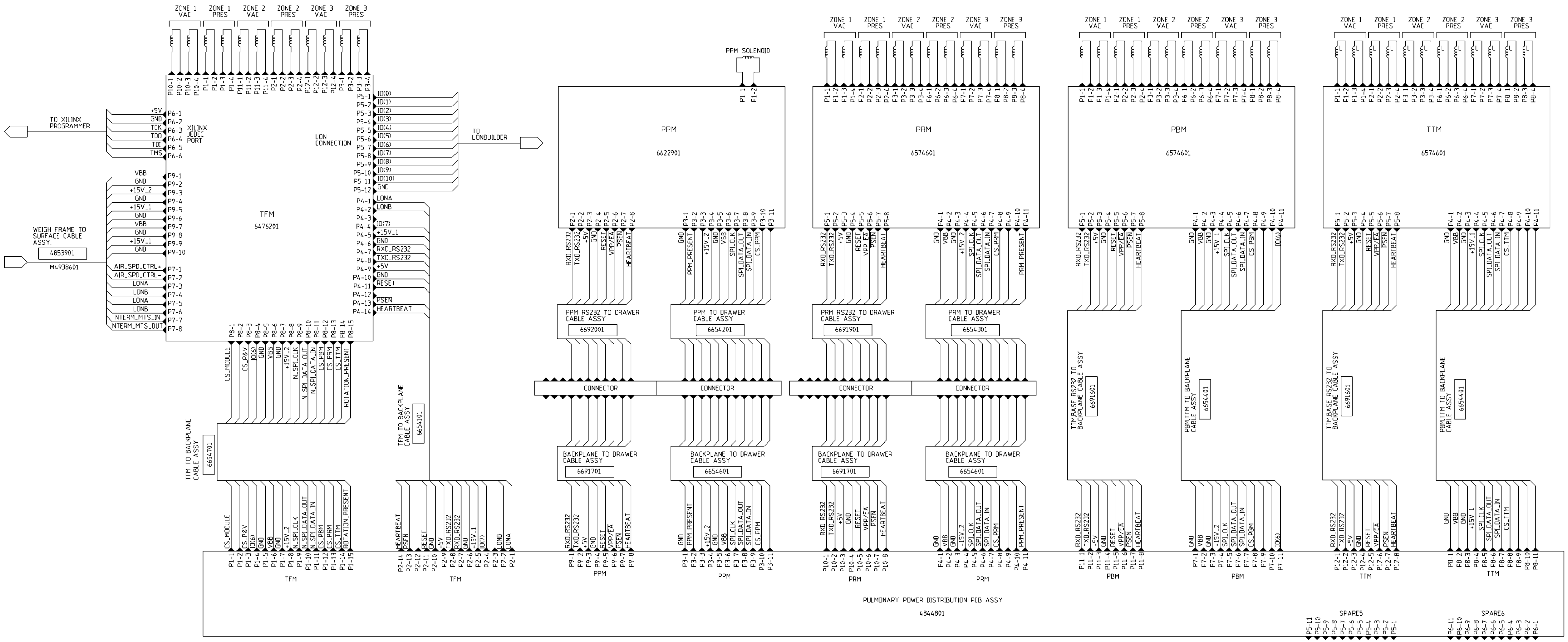

THIGH
SEAT
HEAD
PRESS
VAC
SW1
SW2
SW3
SW4
SW5
SW6
S
N
BLU
GRN
RED
BLK
T1
T2
T3
T4
P4-5
P4-8
P4-1
P8-1
P8-2
P8-3
P8-4
P4-4
P4-7
P4-2
P9-1
P9-2
P9-3
P9-4
P4-6
P4-3
P10-1
P10-2
P10-3
P10-4
4847401
TSCM PCB
ASSY
M4938602
P5-1 AGND
P5-2 HEAD_PRESS
P5-3 AGND
P5-4 THIGH_PRESS
P5-5 AGND
P5-6 SEAT_PRESS
P5-7 +5VA
P2-1 +12V
P2-2 +5V
P2-3 SPI DATA-->
P2-4 <--SPI DATA
P2-5 SPI CLK
P2-6 CS SER IO-2
P2-7 CS EEPROM
P2-8 LATCH_OUT_ENA
P2-9 TSCM_RST
P2-10 GND
P2-11 GND
P2-12 GND
M4938602
3054801
TFSCM TO
TSCM
CABLE
ASSEMBLY
3049601
TFSCM XDUCER
PCB ASSEMBLY
COLLAPSE
RETRACT
HEEL
4847101
TREATMENT
FOOT SURFACE
PCB ASSY
M4938601
P11-1
P11-2
CT
P1-1 VBB_LARCM
P1-2 GND_LARCM
P1-3 +15V_PVCM
P1-4 15V_GND_PVCM
P1-5 +15V_LARCM
P1-6 15V_GND_LARCM
P1-7 VBB
P1-8 GND
P1-9 +15V
P1-10 GND
P12-1 AIR_SPD_CTRL+
P12-2 AIR_SPD_CTRL-
P12-3 LONA_MTS_IN
P12-4 LONB_MTS_IN
P12-5 LONA_MTS_OUT
P12-6 LONB_MTS_OUT
P12-7 NTERM_MTS_IN
P12-8 NTERM_MTS_OUT
WEIGH FRAME TO
SURFACE CABLE
ASSY.
M4938601
4853901
3049601
TFSCM XDUCER
PCB ASSEMBLY
3049602
TFSCM XDUCER
PCB ASSEMBLY

m112a233


HYDRAULIC CIRCUIT
RESERVOIR
CONTROL MANIFOLD
FOOT ARTICULATION CYLINDER
/1.500 BORE
/.625 ROD
7.00 STROKE
PSI EXTEND 33-43 SECS.
PSI RETRACT 33-43 SECS.
FA B
P3
FAR
P4
180 PSI
FOOT RETRACTION CYLINDER
/1.000 BORE
/.500 ROD
12.00 STROKE
PSI EXTEND 15-19 SECS.
PSI RETRACT 15-19 SECS.
FRB
P5
FRR
P6
KNEE CYLINDER
/1.500 BORE
1.75 STROKE
PSI EXTEND 10-15 SECS.
GRAV. RETRACT 3-10 SECS.
KN
P2
HEAD CYLINDER
/1.500 BORE
11.00 STROKE
PSI EXTEND 30-40 SECS.
GRAV. RETRACT 30-40 SECS. & CPR
HD
P1
CPR
HILO FOOTCYLINDER
/2.000 BORE
6.25 STROKE
PSI EXTEND 30-45 SECS.
GRAV. RETRACT 30-40 SECS.
HILO CYLINDER
HL
P8
HLR
P7
HILO HEAD CYLINDER
/2.000 BORE
4.00 STROKE
PSI EXTEND 30-45 SECS.
GRAV. RETRACT 30-40 SECS.
& EMERGENCY TREND (ET)
HLB
P9
ET
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
900 PSI
/.625 BORE
1.75 USEABLE STROKE
FOOT PUMP
/.500 BORE
1.75 USEABLE STROKE
1000 PSI
1000 PSI
GREEN S1 FT-UP
BLACK S3 FT-OUT
ATTENTION!
REFER SERVICING TO
QUALIFIED PERSONNEL
BLUE S2 FT-DN
WHT/RED S4 FT-IN
ORANGE S5 KN-UP
BROWN S7 HD-UP
WHT/YEL S9 HLHD-UP
WHT/BLK S11 HLFT-UP
ORANGE
P3
GREEN
P5
YELLOW
S6
KN-DN
RED
S8
HD-DN
WHT/BLU
S10
HLHD-DN
ET
WHT/GRN
S12
HLFT-DN
VIOLET
P7
CPR
YELLOW
P4
BLUE
P6
RED
P2
BLACK
P1
WHITE
P9
BROWN
P8

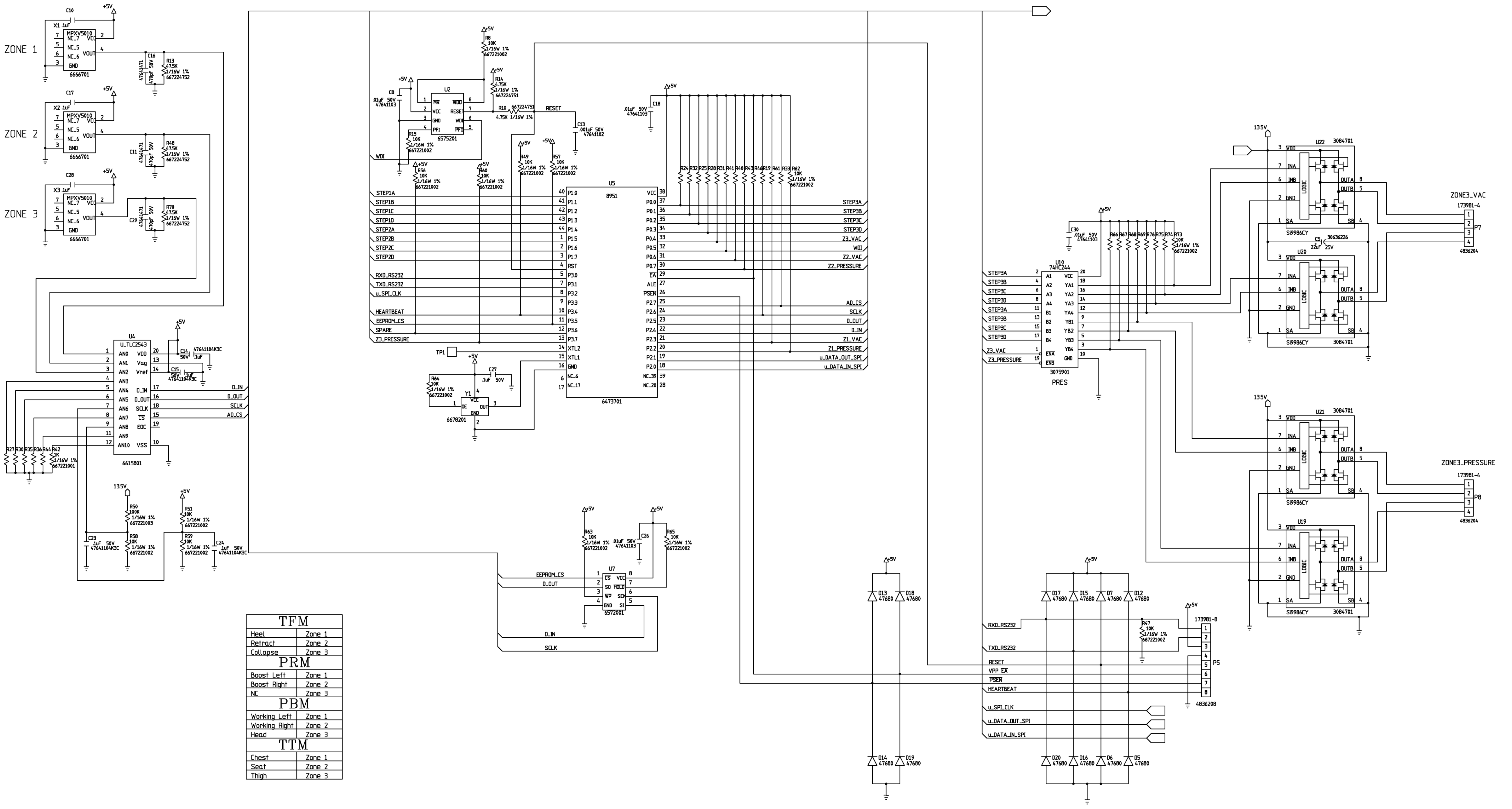
m112b264

PULMONARY WIRING DIAGRAM


ZONE 1 VAC
ZONE 1 PRES
ZONE 2 VAC
ZONE 2 PRES
ZONE 3 VAC
ZONE 3 PRES
TO XILINX PROGRAMMER
XILINX JEDEC PORT
WEIGH FRAME TO SURFACE CABLE ASSY.
4853901
M4938601
TFM
6476201
LON CONNECTION
TO LONBUILDER
PPM SOLENOID
PPM
6622901
PRM
6574601
PBM
6574601
TTM
6574601
PPM RS232 TO DRAWER CABLE ASSY
6692001
PPM TO DRAWER CABLE ASSY
6654201
PRM RS232 TO DRAWER CABLE ASSY
6691901
PRM TO DRAWER CABLE ASSY
6654301
CONNECTOR
BACKPLANE TO DRAWER CABLE ASSY
6691701
BACKPLANE TO DRAWER CABLE ASSY
6654601
TFM TO BACKPLANE CABLE ASSY
6654701
TFM TO BACKPLANE CABLE ASSY
6654101
TTMBASE RS232 TO BACKPLANE CABLE ASSY
6691601
PBM,TTM TO BACKPLANE CABLE ASSY
6654401
PULMONARY POWER DISTRIBUTION PCB ASSY
4844801
SPARE5
SPARE6
+5V
GND
TCK
TDO
TDI
TMS
VBB
+15V_2
+15V_1
AIR_SPD_CTRL+
AIR_SPD_CTRL-
LONA
LONB
NTERM_MTS_IN
NTERM_MTS_OUT
ID(0)
ID(1)
ID(2)
ID(3)
ID(4)
ID(5)
ID(6)
ID(7)
ID(8)
ID(9)
ID(10)
RXD_RS232
TXD_RS232
RESET
PSEN
HEARTBEAT
VPP/EA
PPM_PRESENT
PRM_PRESENT
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_PPM
CS_PRM
CS_PBM
CS_TTM
CS_MODULE
CS_P&V
N_SPI_CLK
N_SPI_DATA_OUT
N_SPI_DATA_IN
ROTATION_PRESENT

m112c276

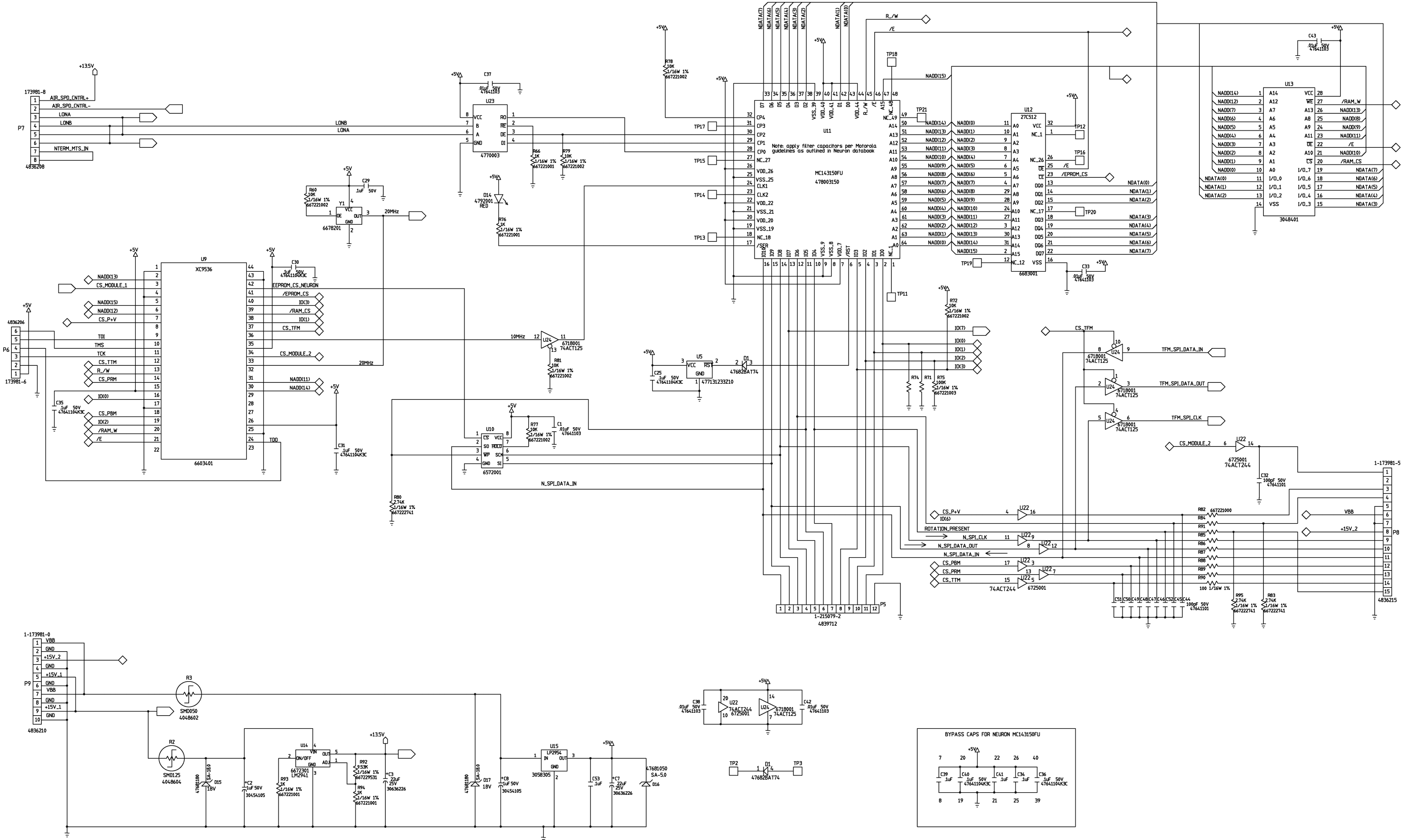
P.C. Board Wiring Schematic Diagram—Treatment Torso Module (P/N 65744) Sheet 1 of 2


ZONE 1
ZONE 2
ZONE 3
MPXV5010
6666701
U2
6575201
U4
U_TLC2543
6615801
U5
8951
6473701
U7
6572001
Y1
6678201
TP1
U10
74HC244
3075901
PRES
U22
U20
U21
U19
SI9986CY
3084701
ZONE3_VAC
ZONE3_PRESSURE
173981-4
P7
P8
173981-8
P5
4836204
4836208
STEP1A
STEP1B
STEP1C
STEP1D
STEP2A
STEP2B
STEP2C
STEP2D
RXD_RS232
TXD_RS232
u_SPI_CLK
HEARTBEAT
EEPROM_CS
SPARE
Z3_PRESSURE
STEP3A
STEP3B
STEP3C
STEP3D
Z3_VAC
WDI
Z2_VAC
Z2_PRESSURE
AD_CS
SCLK
D_OUT
D_IN
Z1_VAC
Z1_PRESSURE
u_DATA_OUT_SPI
u_DATA_IN_SPI
RESET
VPP EA
PSEN
+5V
13.5V

TFM	
Heel	Zone 1
Retract	Zone 2
Collapse	Zone 3
PRM	
Boost Left	Zone 1
Boost Right	Zone 2
NC	Zone 3
PBM	
Working Left	Zone 1
Working Right	Zone 2
Head	Zone 3
TTM	
Chest	Zone 1
Seat	Zone 2
Thigh	Zone 3

m112c277

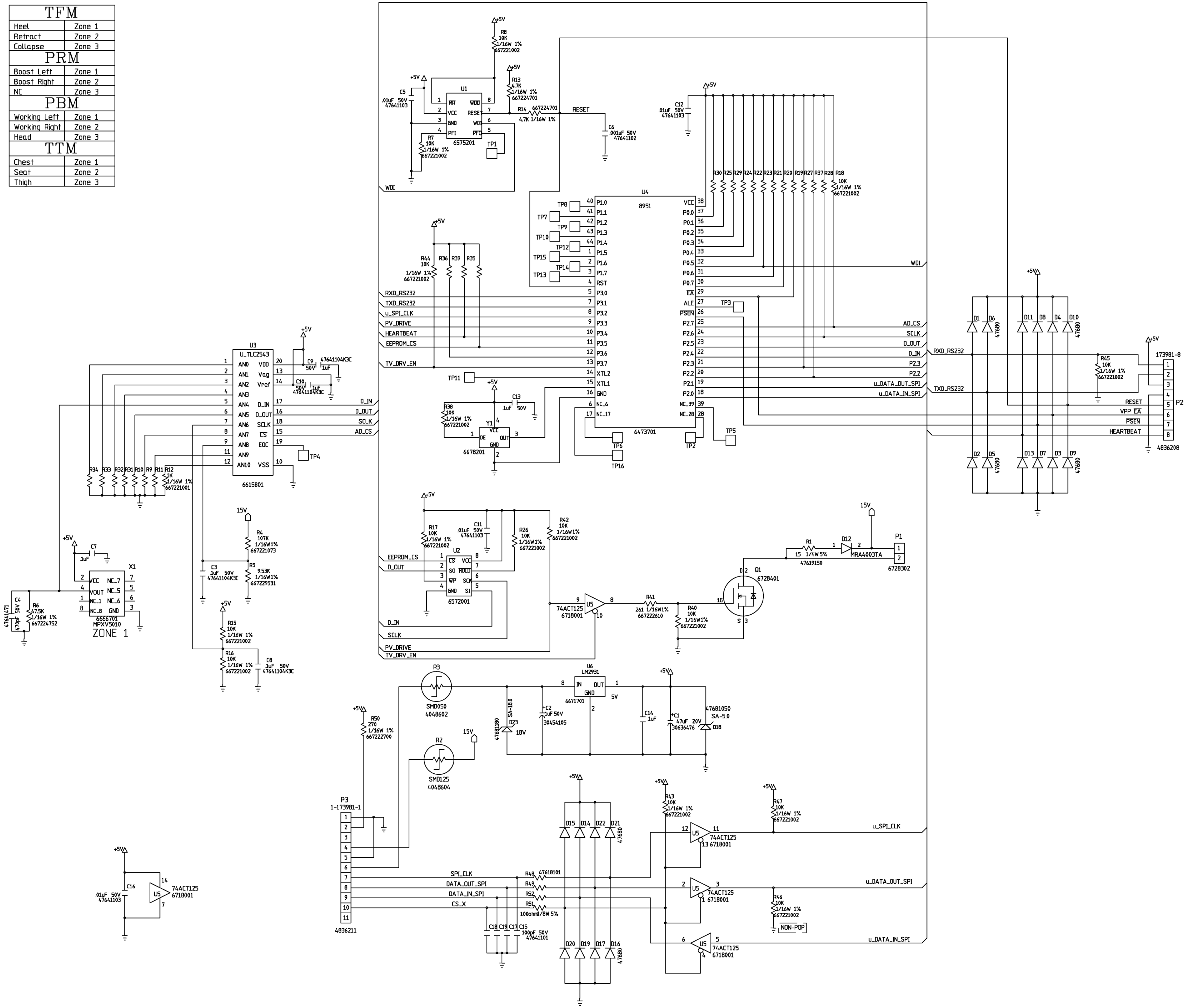
P.C. Board Wiring Schematic Diagram—Treatment Torso Module (P/N 65744) Sheet 2 of 2


U11
MC143150FU
478003150
Note: apply filter capacitors per Motorola guidelines as outlined in Neuron databook
U12
27C512
6683001
U13
3048401
U9
XC9536
6603401
U23
4770003
U10
6572001
U5
477131233Z10
U22
74ACT244
6725001
U24
6718001
74ACT125
U14
LM2941
6672301
U15
LP2954
3058305
Y1
6678201
20MHz
10MHz
D14
4792001
RED
D1
47682BAT74
P7
173981-8
4836208
AIR_SPD_CNTRL+
AIR_SPD_CNTRL-
LONA
LONB
NTERM_MTS_IN
P6
4836206
173981-6
TDI
TMS
TCK
P9
1-173981-0
4836210
VBB
GND
+15V_2
+15V_1
P5
1-215079-2
4839712
P8
1-173981-5
4836215
+135V
+5V
R3
SMD050
4048602
R2
SMD125
4048604
D15
SA-18.0
18V
D16
SA-5.0
47681050
D17
18V
BYPASS CAPS FOR NEURON MC143150FU
CS_MODULE_1
CS_MODULE_2
EEPROM_CS_NEURON
/EPROM_CS
/RAM_CS
/RAM_W
R_/W
/E
CS_TFM
CS_TTM
CS_PRM
CS_PBM
CS_P+V
TFM_SPI_DATA_IN
TFM_SPI_DATA_OUT
TFM_SPI_CLK
N_SPI_DATA_IN
N_SPI_DATA_OUT
N_SPI_CLK
ROTATION_PRESENT
VBB
+15V_2
TP2
TP3
TP11
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20
TP21

m112c278

P.C. Board Schematic Diagram—Pulmonary Percussion Module (P/N 66227)

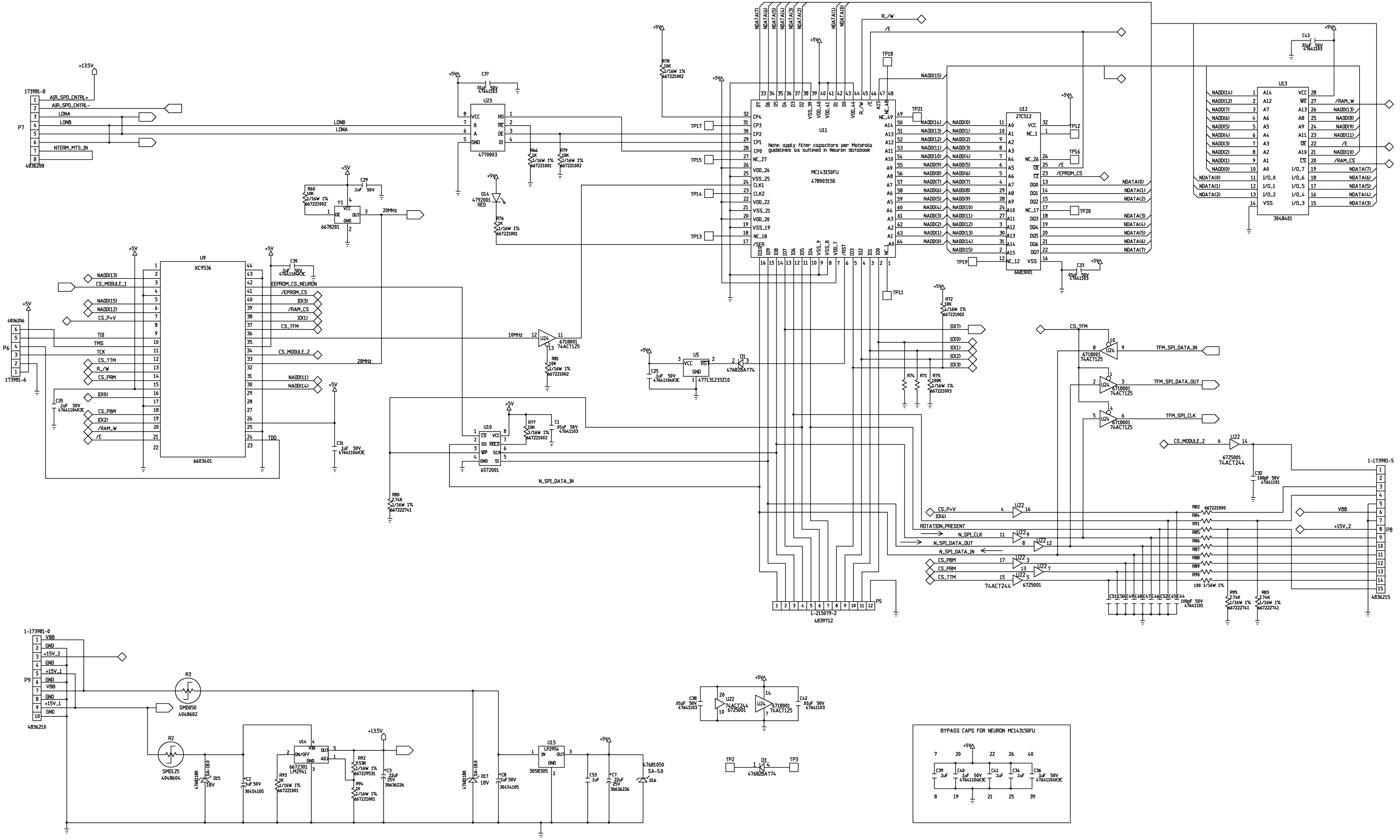
TFM	
Heel	Zone 1
Retract	Zone 2
Collapse	Zone 3
PRM	
Boost Left	Zone 1
Boost Right	Zone 2
NC	Zone 3
PBM	
Working Left	Zone 1
Working Right	Zone 2
Head	Zone 3
TTM	
Chest	Zone 1
Seat	Zone 2
Thigh	Zone 3


U1 6575201
U2 6572001
U3 U_TLC2543 6615801
U4 8951 6473701
U5 74ACT125 6718001
U6 LM2931 6671701
Y1 6678201
Q1 6728401
X1 6666701 MPXV5010
ZONE 1
P1 6728302
P2 173981-8 4836208
P3 1-173981-1 4836211
R2 SMD125 4048604
R3 SMD050 4048602
D12 MRA4003TA
D18 SA-5.0 47681050
D23 SA-18.0 47681180
+5V
15V
RESET
WDI
RXD_RS232
TXD_RS232
u_SPI_CLK
PV_DRIVE
HEARTBEAT
EEPROM_CS
TV_DRV_EN
D_IN
D_OUT
SCLK
AD_CS
VPP EA
PSEN
u_DATA_OUT_SPI
u_DATA_IN_SPI
SPI_CLK
DATA_OUT_SPI
DATA_IN_SPI
CS_X
NON-POP

m112c279

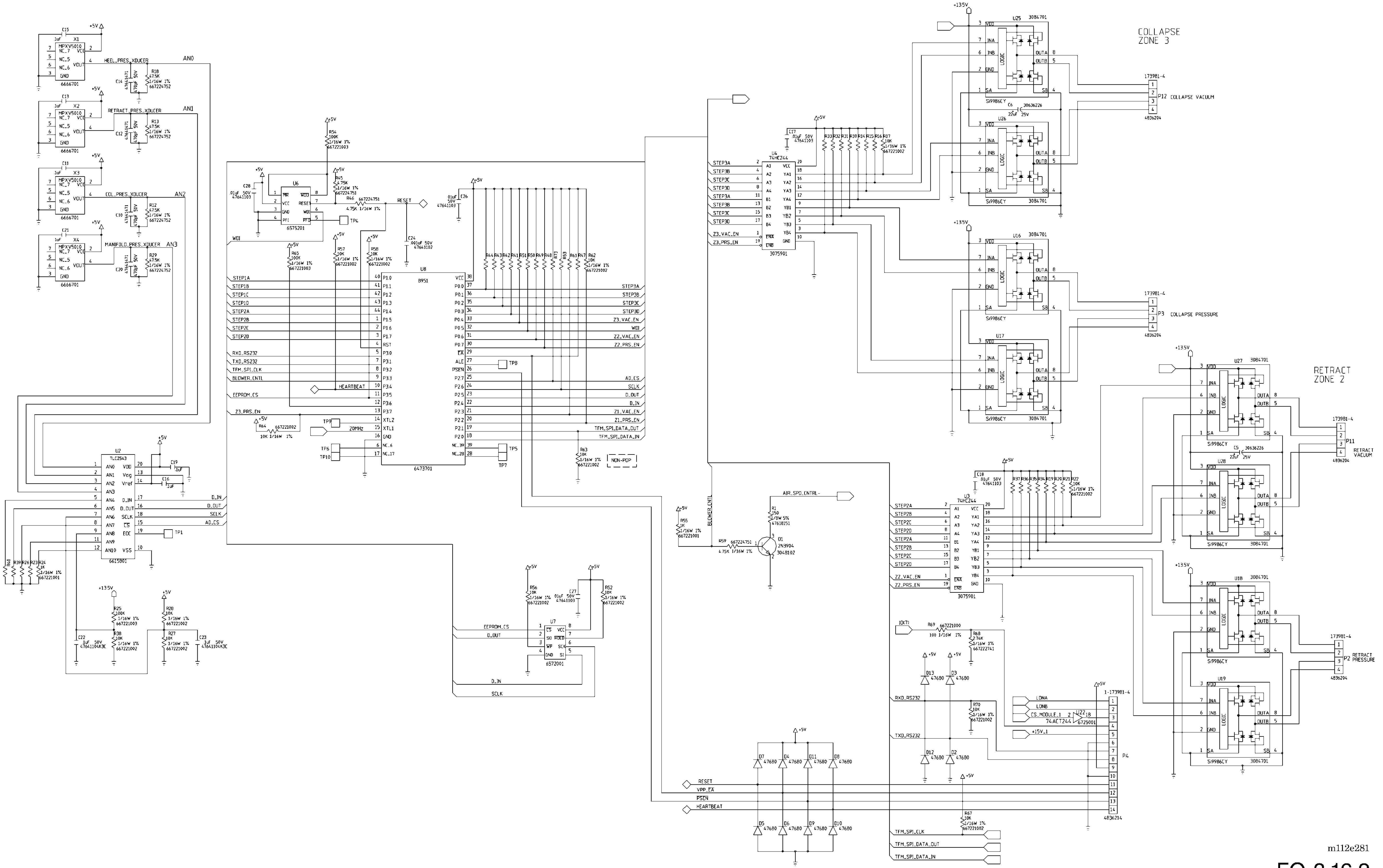
P.C. Board Wiring Schematic Diagram—Treatment Foot Module (P/N 64760) Sheet 1 of 3

2 of 3 2 of 3

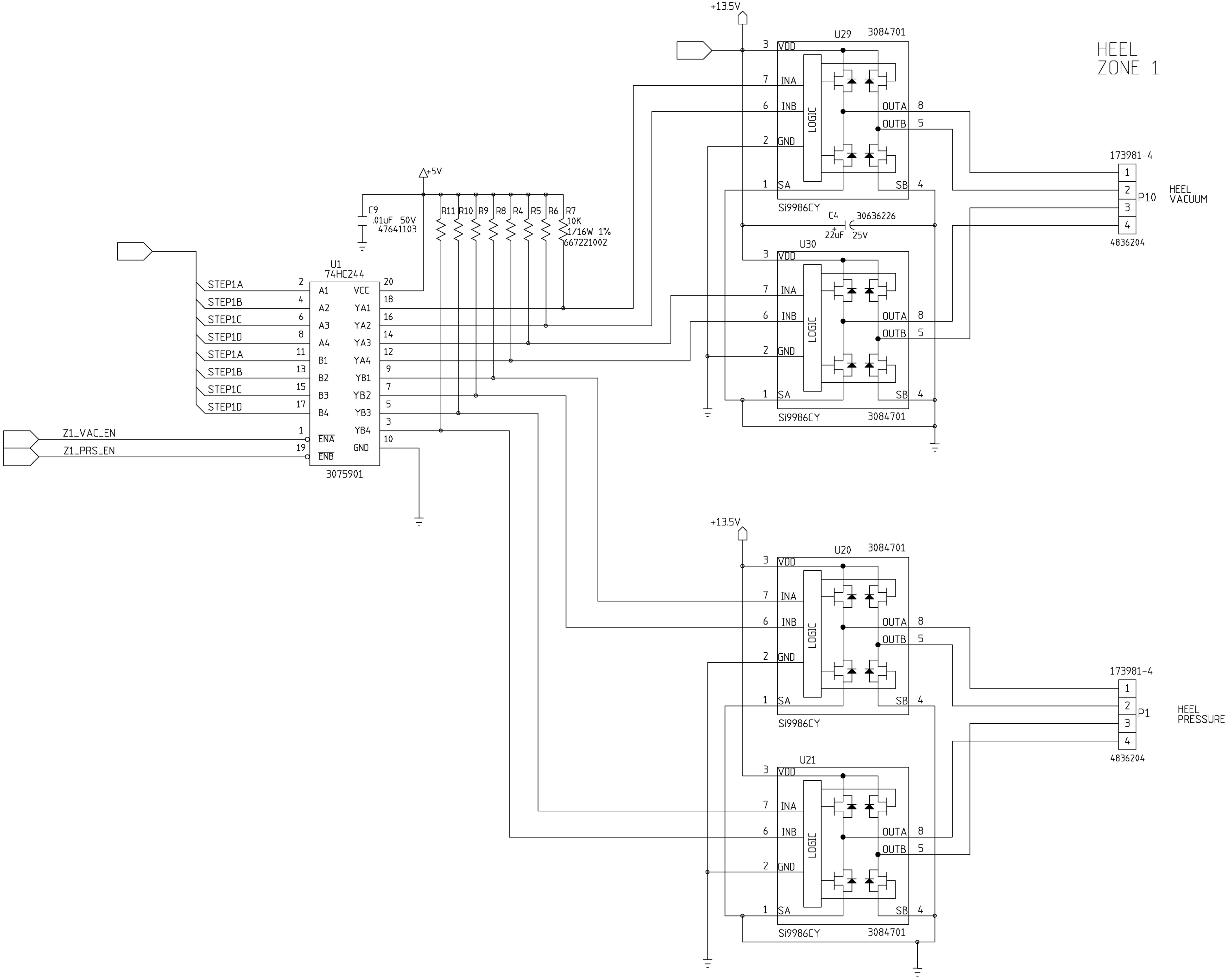

U11
MC143150FU
478003150
Note: apply filter capacitors per Motorola guidelines as outlined in Neuron databook
U12
27C512
6683001
U13
3048401
U9
XC9536
6603401
U23
4770003
U10
6572001
U5
477131233Z10
U24
6718001
74ACT125
U22
6725001
74ACT244
U14
LM2941
U15
LP2954
3058305
Y1
6678201
20MHz
10MHz
P7
P6
P5
P8
P9
1-215079-2
4839712
4836215
4836210
R3
SMD050
4048602
R2
SMD125
4048604
D14
RED
D1
47682BAT74
TP2
TP3
N_SPI_DATA_IN
N_SPI_DATA_OUT
N_SPI_CLK
ROTATION_PRESENT
TFM_SPI_DATA_IN
TFM_SPI_DATA_OUT
TFM_SPI_CLK
CS_MODULE_2
CS_P+V
CS_PBM
CS_PRM
CS_TTM
CS_TFM
VBB
+15V_2
+15V_1
+135V
+5V
LONA
LONB
AIR_SPD_CNTRL+
AIR_SPD_CNTRL-
NTERM_MTS_IN
BYPASS CAPS FOR NEURON MC143150FU

m112c280

Treatment Foot Module (P/N 64760) Sheet 2 of 3

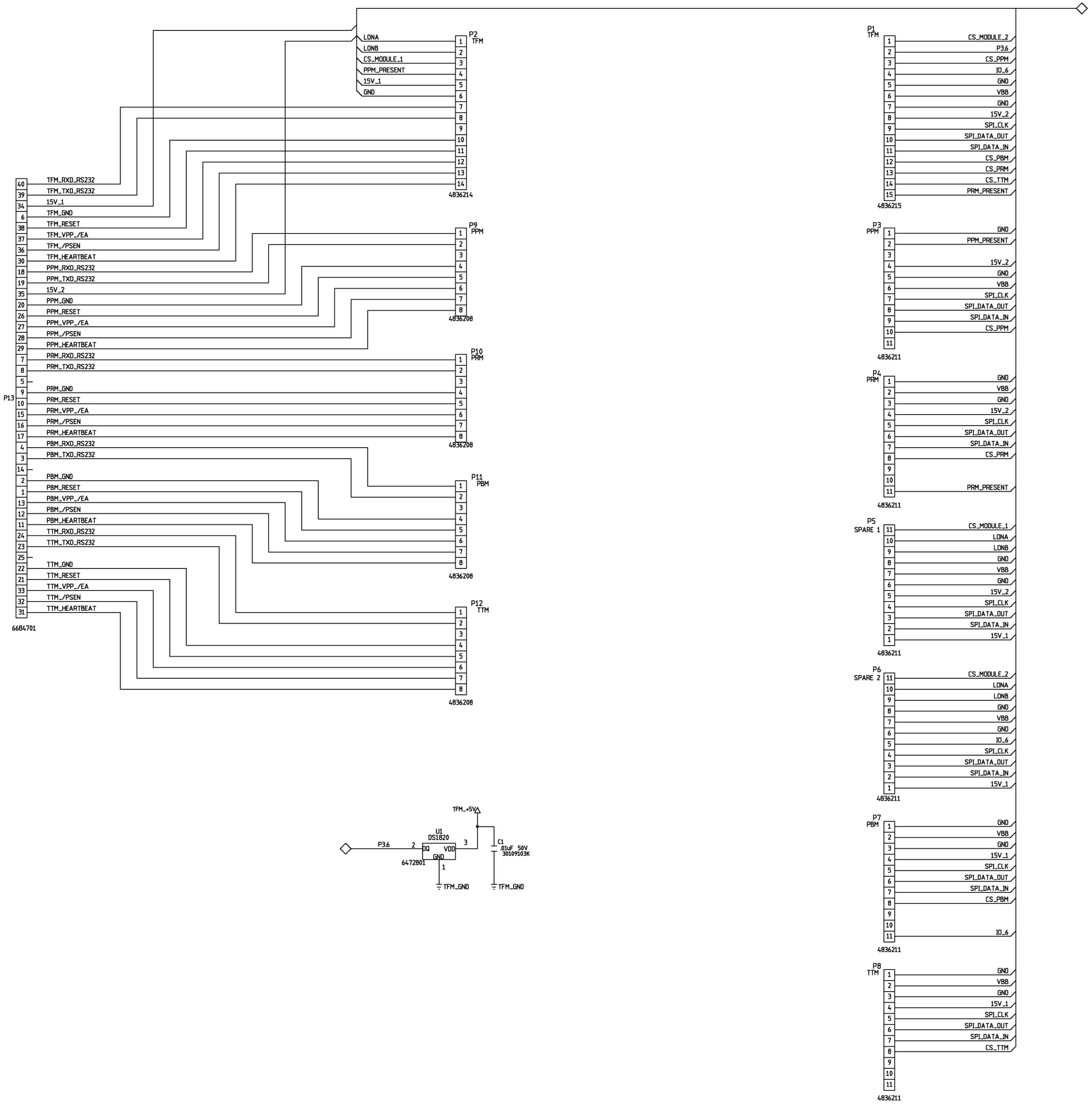

MPXV5010
HEEL_PRES_XDUCER
AN0
RETRACT_PRES_XDUCER
AN1
COL_PRES_XDUCER
AN2
MANIFOLD_PRES_XDUCER
AN3
6666701
U2
TLC2543
6615801
U6
6575201
U8
8951
6473701
U7
6572001
EEPROM_CS
D_OUT
D_IN
SCLK
AD_CS
RESET
HEARTBEAT
WDI
20MHZ
NON-POP
STEP1A
STEP1B
STEP1C
STEP1D
STEP2A
STEP2B
STEP2C
STEP2D
RXD_RS232
TXD_RS232
TFM_SPI_CLK
BLOWER_CNTL
EEPROM_CS
Z3_PRS_EN
STEP3A
STEP3B
STEP3C
STEP3D
Z3_VAC_EN
Z2_VAC_EN
Z2_PRS_EN
Z1_VAC_EN
Z1_PRS_EN
TFM_SPI_DATA_OUT
TFM_SPI_DATA_IN
U4
74HC244
3075901
U3
74HC244
BLOWER_CNTL
AIR_SPD_CNTRL
Q1
2N3904
3048102
+135V
+5V
U25
U26
U16
U17
U27
U28
U18
U19
Si9986CY
3084701
COLLAPSE ZONE 3
173981-4
P12 COLLAPSE VACUUM
P3 COLLAPSE PRESSURE
4836204
RETRACT ZONE 2
P11 RETRACT VACUUM
P2 RETRACT PRESSURE
LDNA
LDNB
CS_MODULE_1
U22
74ACT244
6725001
+15V_1
1-173981-4
P4
4836214
VPP_EA
PSEN
47680
IO(7)
m112e281

P.C. Board Wiring Schematic Diagram—Treatment Foot Module (P/N 64760) Sheet 3 of 3


+13.5V
U29
3084701
HEEL
ZONE 1
VDD
INA
INB
GND
SA
SB
OUTA
OUTB
LOGIC
Si9986CY
173981-4
P10
HEEL
VACUUM
4836204
+5V
C9
.01uF 50V
47641103
R11 R10 R9 R8 R4 R5 R6 R7
10K
1/16W 1%
667221002
C4
30636226
22uF 25V
U30
U1
74HC244
STEP1A
STEP1B
STEP1C
STEP1D
A1 A2 A3 A4 B1 B2 B3 B4
VCC YA1 YA2 YA3 YA4 YB1 YB2 YB3 YB4 GND
ENA
ENB
Z1_VAC_EN
Z1_PRS_EN
3075901
U20
3084701
P1
HEEL
PRESSURE
U21

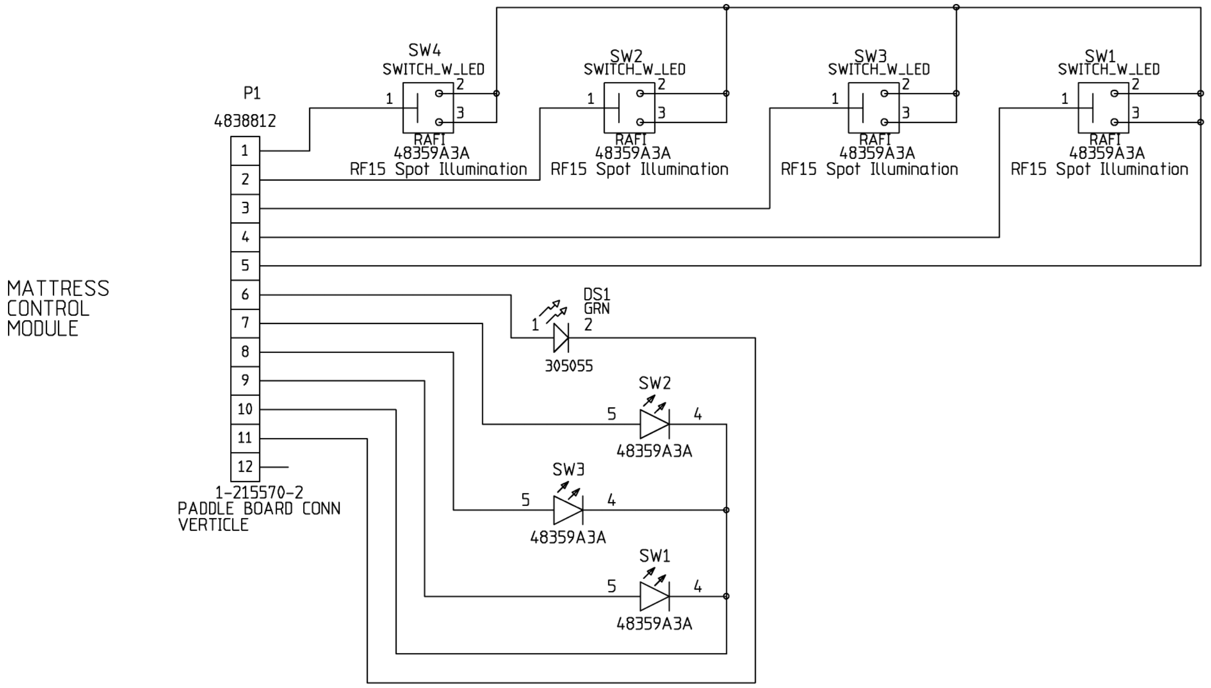
m112c282

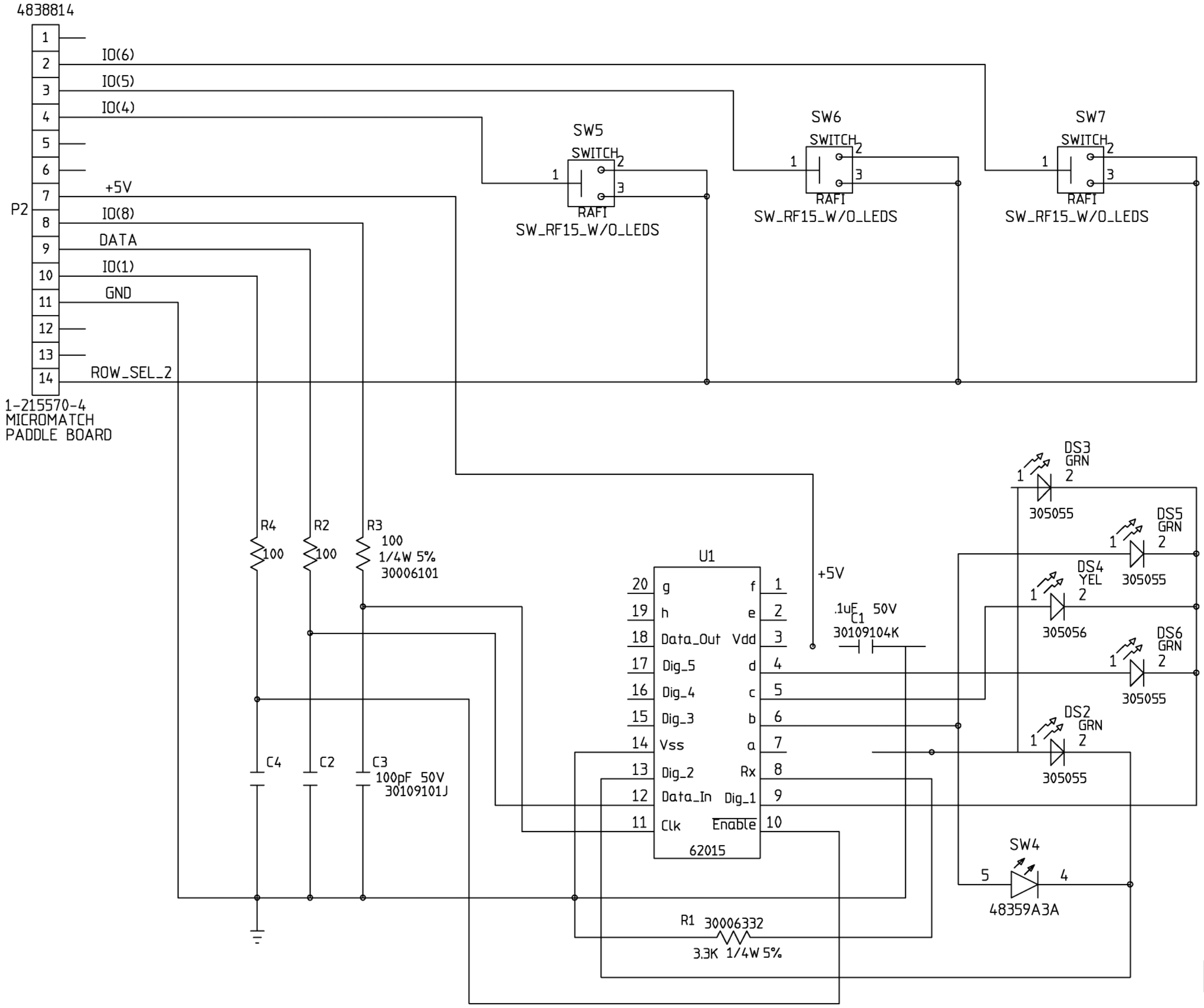
P.C. Board Wiring Schematic Diagram—Pulmonary Power Distribution (P/N 48446)


P13
TFM_RXD_RS232
TFM_TXD_RS232
15V_1
TFM_GND
TFM_RESET
TFM_VPP_/EA
TFM_/PSEN
TFM_HEARTBEAT
PPM_RXD_RS232
PPM_TXD_RS232
15V_2
PPM_GND
PPM_RESET
PPM_VPP_/EA
PPM_/PSEN
PPM_HEARTBEAT
PRM_RXD_RS232
PRM_TXD_RS232
PRM_GND
PRM_RESET
PRM_VPP_/EA
PRM_/PSEN
PRM_HEARTBEAT
PBM_RXD_RS232
PBM_TXD_RS232
PBM_GND
PBM_RESET
PBM_VPP_/EA
PBM_/PSEN
PBM_HEARTBEAT
TTM_RXD_RS232
TTM_TXD_RS232
TTM_GND
TTM_RESET
TTM_VPP_/EA
TTM_/PSEN
TTM_HEARTBEAT
6684701
P2 TFM
LONA
LONB
CS_MODULE_1
PPM_PRESENT
15V_1
GND
4836214
P9 PPM
4836208
P10 PRM
4836208
P11 PBM
4836208
P12 TTM
4836208
P1 TFM
CS_MODULE_2
P3.6
CS_PPM
IO_6
GND
VBB
GND
15V_2
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_PBM
CS_PRM
CS_TTM
PRM_PRESENT
4836215
P3 PPM
GND
PPM_PRESENT
15V_2
GND
VBB
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_PPM
4836211
P4 PRM
GND
VBB
GND
15V_2
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_PRM
PRM_PRESENT
4836211
P5 SPARE 1
CS_MODULE_1
LONA
LONB
GND
VBB
GND
15V_2
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
15V_1
4836211
P6 SPARE 2
CS_MODULE_2
LONA
LONB
GND
VBB
GND
IO_6
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
15V_1
4836211
P7 PBM
GND
VBB
GND
15V_1
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_PBM
IO_6
4836211
P8 TTM
GND
VBB
GND
15V_1
SPI_CLK
SPI_DATA_OUT
SPI_DATA_IN
CS_TTM
4836211
TFM_+5V
P3.6
U1
DS1820
DQ
VDD
GND
6472801
C1
.01uF 50V
30109103K
TFM_GND
TFM_GND

m112c283

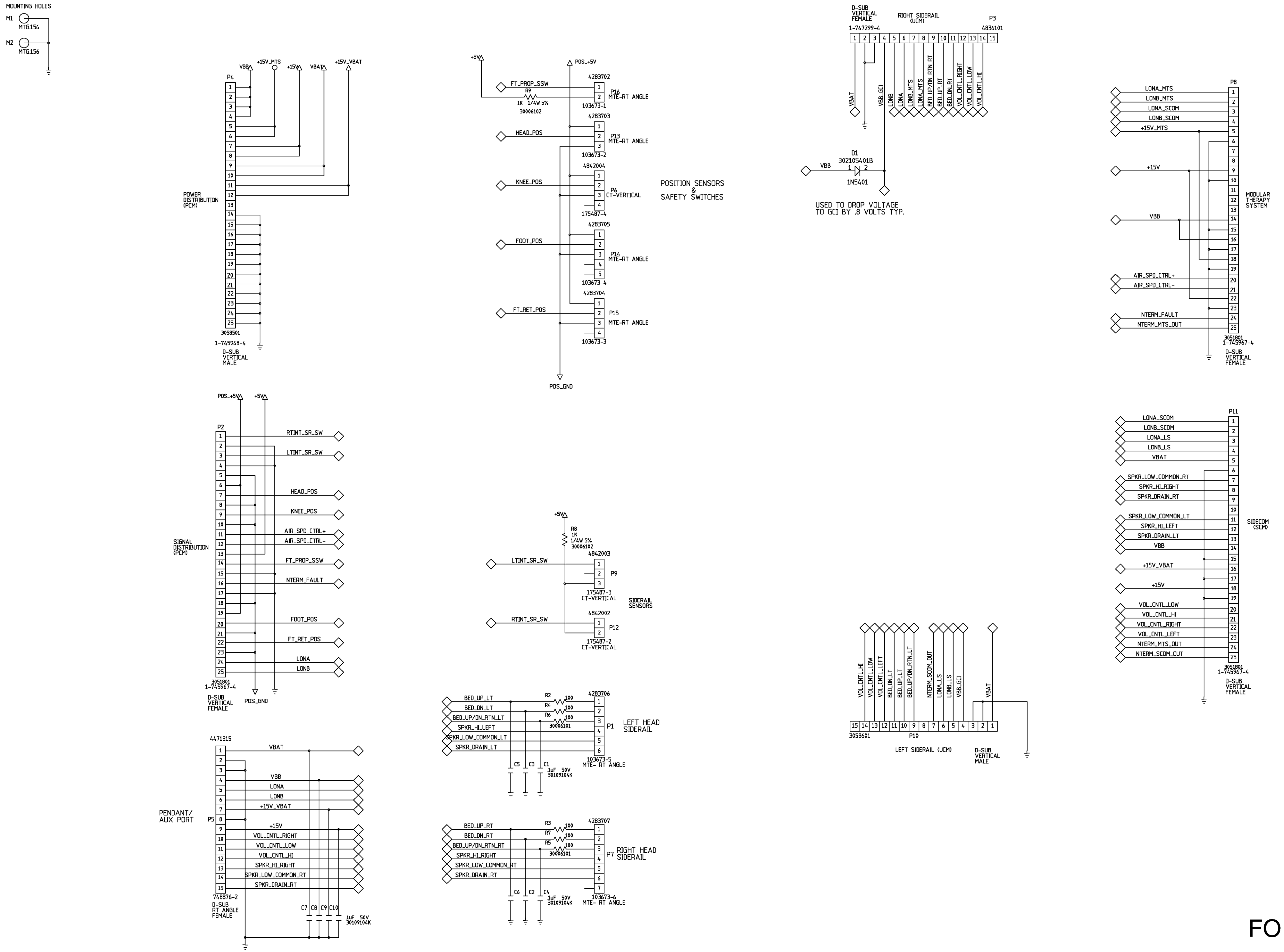
P.C. Board Wiring Schematic Diagram—Pulmonary Hardpanel (P/N 60390)


SW4
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW2
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW3
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW1
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
P1
4838812
MATTRESS
CONTROL
MODULE
1
2
3
4
5
6
7
8
9
10
11
12
1-215570-2
PADDLE BOARD CONN
VERTICLE
DS1
GRN
305055
SW2
48359A3A
SW3
48359A3A
SW1
48359A3A


4838814
P2
IO(6)
IO(5)
IO(4)
+5V
IO(8)
DATA
IO(1)
GND
ROW_SEL_2
1-215570-4
MICROMATCH
PADDLE BOARD
SW5
SWITCH
RAFI
SW_RF15_W/O_LEDS
SW6
SWITCH
RAFI
SW_RF15_W/O_LEDS
SW7
SWITCH
RAFI
SW_RF15_W/O_LEDS
R4
100
R2
100
R3
100
1/4W 5%
30006101
C4
C2
C3
100pF 50V
30109101J
U1
g
h
Data_Out
Dig_5
Dig_4
Dig_3
Vss
Dig_2
Data_In
Clk
f
e
Vdd
d
c
b
a
Rx
Dig_1
Enable
62015
+5V
.1uF 50V
C1
30109104K
DS3
GRN
305055
DS5
GRN
305055
DS4
YEL
305056
DS6
GRN
305055
DS2
GRN
305055
SW4
48359A3A
R1 30006332
3.3K 1/4W 5%

m112c284

P.C. Board Wiring Schematic Diagram—Weighframe Junction (P/N 46992)


MOUNTING HOLES
M1
MTG.156
M2
MTG.156
VBB
+15V_MTS
+15V
VBAT
+15V_VBAT
P4
POWER DISTRIBUTION (PCM)
3058501
1-745968-4
D-SUB VERTICAL MALE
+5V
POS_+5V
FT_PROP_SSW
R9
1K 1/4W 5%
30006102
4283702
P16
MTE-RT ANGLE
103673-1
4283703
HEAD_POS
P13
MTE-RT ANGLE
103673-2
4842004
KNEE_POS
P6
CT-VERTICAL
175487-4
POSITION SENSORS & SAFETY SWITCHES
4283705
FOOT_POS
P14
MTE-RT ANGLE
103673-4
4283704
FT_RET_POS
P15
MTE-RT ANGLE
103673-3
POS_GND
D-SUB VERTICAL FEMALE
RIGHT SIDERAIL (UCM)
P3
1-747299-4
4836101
VBAT
VBB_GCI
LONB
LONA
LONB_MTS
LONA_MTS
BED_UP/DN_RTN_RT
BED_UP_RT
BED_DN_RT
VOL_CNTL_RIGHT
VOL_CNTL_LOW
VOL_CNTL_HI
D1
302105401B
VBB
1N5401
USED TO DROP VOLTAGE TO GCI BY .8 VOLTS TYP.
P8
LONA_MTS
LONB_MTS
LONA_SCOM
LONB_SCOM
+15V_MTS
+15V
VBB
AIR_SPD_CTRL+
AIR_SPD_CTRL-
NTERM_FAULT
NTERM_MTS_OUT
MODULAR THERAPY SYSTEM
3051801
1-745967-4
D-SUB VERTICAL FEMALE
POS_+5V
+5V
P2
RTINT_SR_SW
LTINT_SR_SW
HEAD_POS
KNEE_POS
AIR_SPD_CTRL+
AIR_SPD_CTRL-
FT_PROP_SSW
NTERM_FAULT
FOOT_POS
FT_RET_POS
LONA
LONB
SIGNAL DISTRIBUTION (PCM)
3051801
1-745967-4
D-SUB VERTICAL FEMALE
POS_GND
+5V
R8
1K
1/4W 5%
30006102
4842003
LTINT_SR_SW
P9
175487-3
CT-VERTICAL
SIDERAIL SENSORS
4842002
RTINT_SR_SW
P12
175487-2
CT-VERTICAL
P11
LONA_SCOM
LONB_SCOM
LONA_LS
LONB_LS
VBAT
SPKR_LOW_COMMON_RT
SPKR_HI_RIGHT
SPKR_DRAIN_RT
SPKR_LOW_COMMON_LT
SPKR_HI_LEFT
SPKR_DRAIN_LT
VBB
+15V_VBAT
+15V
VOL_CNTL_LOW
VOL_CNTL_HI
VOL_CNTL_RIGHT
VOL_CNTL_LEFT
NTERM_MTS_OUT
NTERM_SCOM_OUT
SIDECOM (SCM)
3051801
1-745967-4
D-SUB VERTICAL FEMALE
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
BED_DN_LT
BED_UP_LT
BED_UP/DN_RTN_LT
NTERM_SCOM_OUT
LONA_LS
LONB_LS
VBB_GCI
VBAT
3058601
P10
LEFT SIDERAIL (UCM)
D-SUB VERTICAL MALE
BED_UP_LT
BED_DN_LT
BED_UP/DN_RTN_LT
SPKR_HI_LEFT
SPKR_LOW_COMMON_LT
SPKR_DRAIN_LT
R2
R4
R6
100
30006101
4283706
P1
LEFT HEAD SIDERAIL
103673-5
MTE- RT ANGLE
C5
C3
C1
.1uF 50V
30109104K
4471315
VBAT
VBB
LONA
LONB
+15V_VBAT
+15V
VOL_CNTL_RIGHT
VOL_CNTL_LOW
VOL_CNTL_HI
SPKR_HI_RIGHT
SPKR_LOW_COMMON_RT
SPKR_DRAIN_RT
PENDANT/ AUX PORT
P5
748876-2
D-SUB RT ANGLE FEMALE
C7
C8
C9
C10
.1uF 50V
30109104K
BED_UP_RT
BED_DN_RT
BED_UP/DN_RTN_RT
SPKR_HI_RIGHT
SPKR_LOW_COMMON_RT
SPKR_DRAIN_RT
R3
R7
R5
100
30006101
4283707
P7
RIGHT HEAD SIDERAIL
C6
C2
C4
.1uF 50V
30109104K
103673-6
MTE- RT ANGLE

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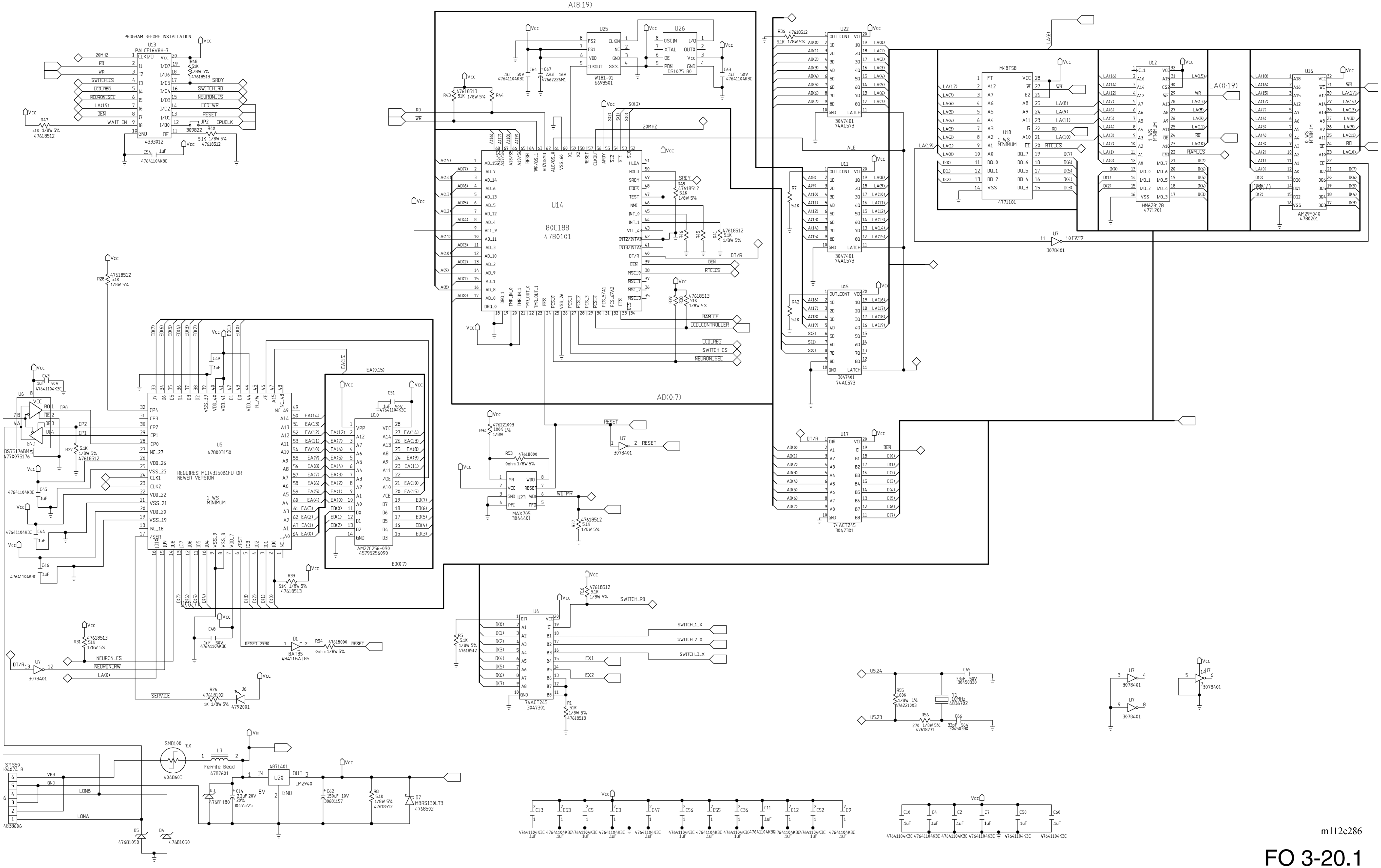
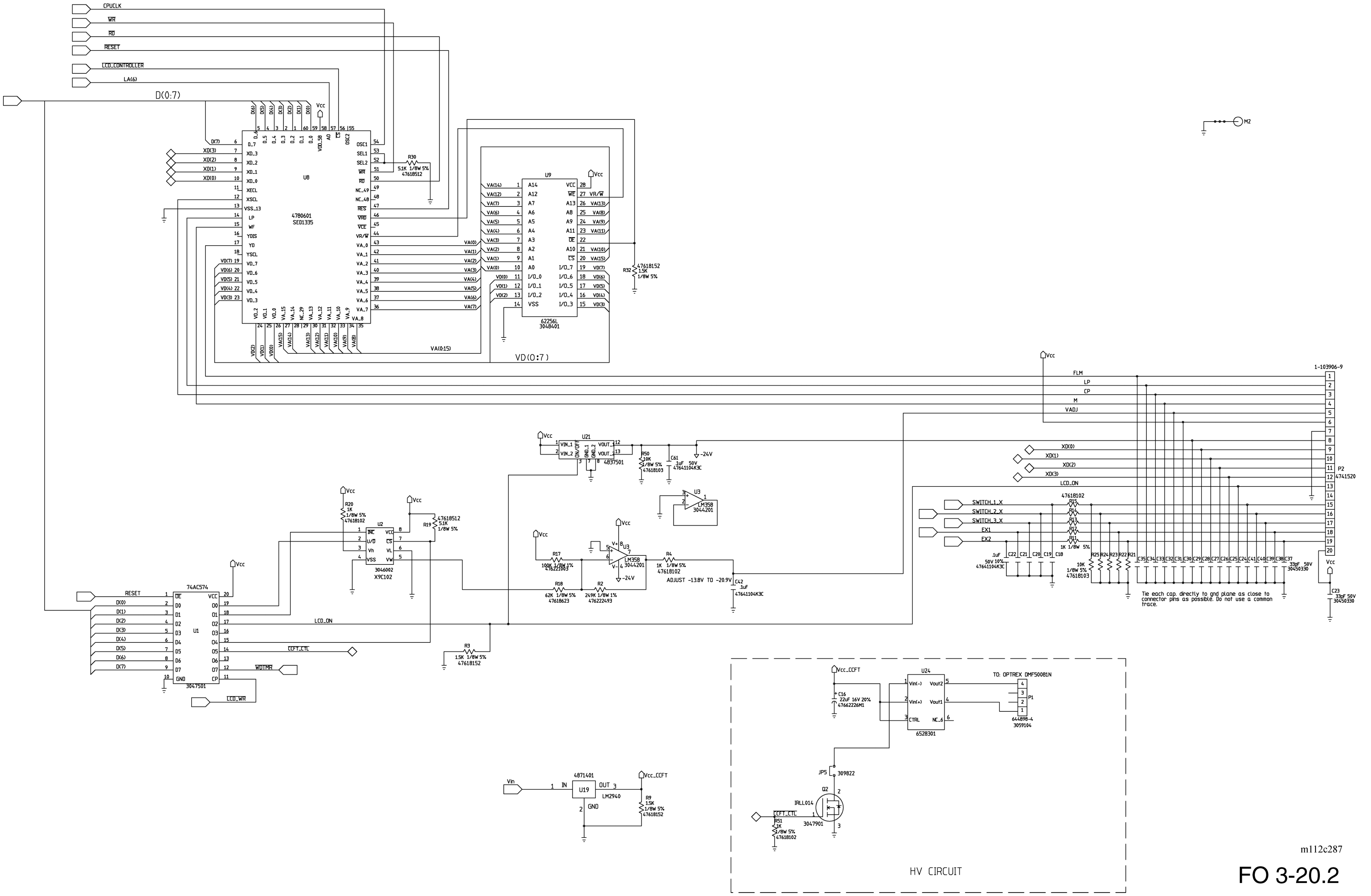
P.C. Board Wiring Schematic Diagram—Graphical Caregiver Interface (GCI)® Control (P/N 47033) Sheet 1 of 2


A(8:19)
PROGRAM BEFORE INSTALLATION
U13
PALCE16V8H-7
4333012
U25
W181-01
6698501
U26
DS1075-80
U14
80C188
4780101
U22
3047401
74AC573
U11
3047401
74AC573
U15
3047401
74AC573
U18
M48T58
4771101
U12
HM628128
4771201
U16
AM29F040
4780201
LA(0:19)
AD(0:7)
U5
478003150
REQUIRES MC143150B1FU OR NEWER VERSION
U10
AM27C256-090
45795256090
EA(0:15)
ED(0:7)
U23
MAX705
3044401
U17
74ACT245
3047301
U4
74ACT245
3047301
U6
DS75176BM
4770075176
U20
LM2940
4871401
L3
Ferrite Bead
4787601
SMD100
4048603
SYS50
4838606
Y1
10MHz
4836702
U7
3078401
RESET
SWITCH_RD
SWITCH_1_X
SWITCH_2_X
SWITCH_3_X
EX1
EX2
NEURON_CS
NEURON_RW
SERVICE
WDTMR
RAM_CS
RTC_CS
LCD_CONTROLLER
LCD_REG
SWITCH_CS
NEURON_SEL
DT/R
DEN
ALE
Vcc
Vin
LONA
LONB
VBB
GND

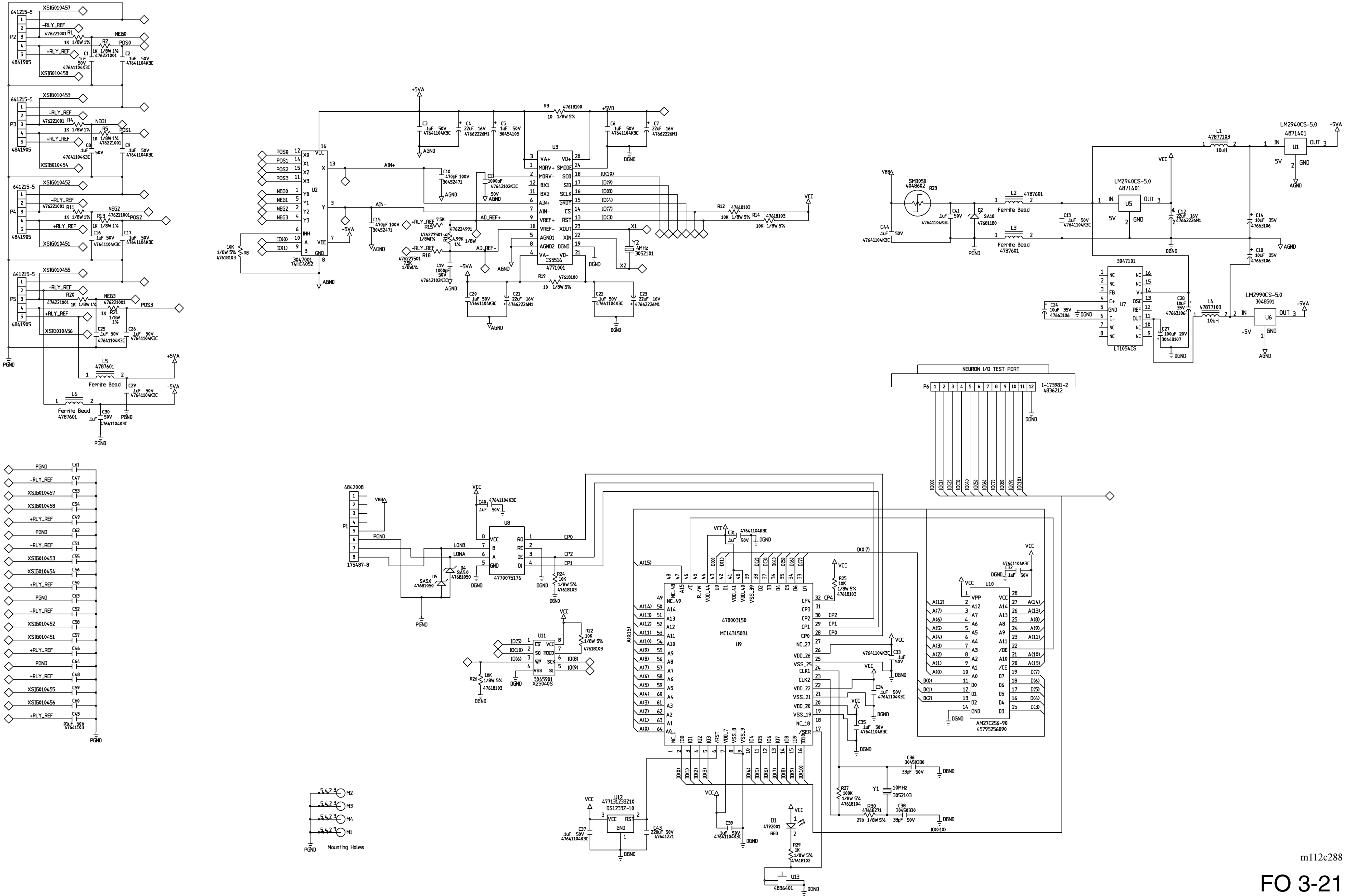
m112c286

P.C. Board Wiring Schematic Diagram—Graphical Caregiver Interface (GCI)® Control (P/N 47033) Sheet 2 of 2


CPUCLK
WR
RD
RESET
LCD_CONTROLLER
LA(6)
D(0:7)
U8
4780601
SED1335
R30
5.1K 1/8W 5%
47618512
U9
62256L
3048401
VA(0:15)
VD(0:7)
R32
47618152
1.5K
1/8W 5%
M2
1-103906-9
FLM
LP
CP
M
VADJ
XD(0)
XD(1)
XD(2)
XD(3)
LCD_ON
SWITCH_1_X
SWITCH_2_X
SWITCH_3_X
EX1
EX2
P2
4741520
U21
4837501
-24V
R50
C61
U3
LM358
3044201
U2
3046002
X9C102
R20
R19
R17
R18
R2
R4
ADJUST -13.8V TO -20.9V
C42
R3
1.5K 1/8W 5%
47618152
74AC574
U1
3047501
CCFT_CTL
WDTMR
LCD_WR
Tie each cap. directly to gnd plane as close to connector pins as possible. Do not use a common trace.
C23
U24
6528301
TO: OPTREX DMF50081N
P1
644898-4
3059104
C16
22uF 16V 20%
47662226M1
JP5
309822
Q2
IRLL014
3047901
R51
U19
4871401
LM2940
Vin
Vcc_CCFT
R9
1.5K
1/8W 5%
47618152
HV CIRCUIT

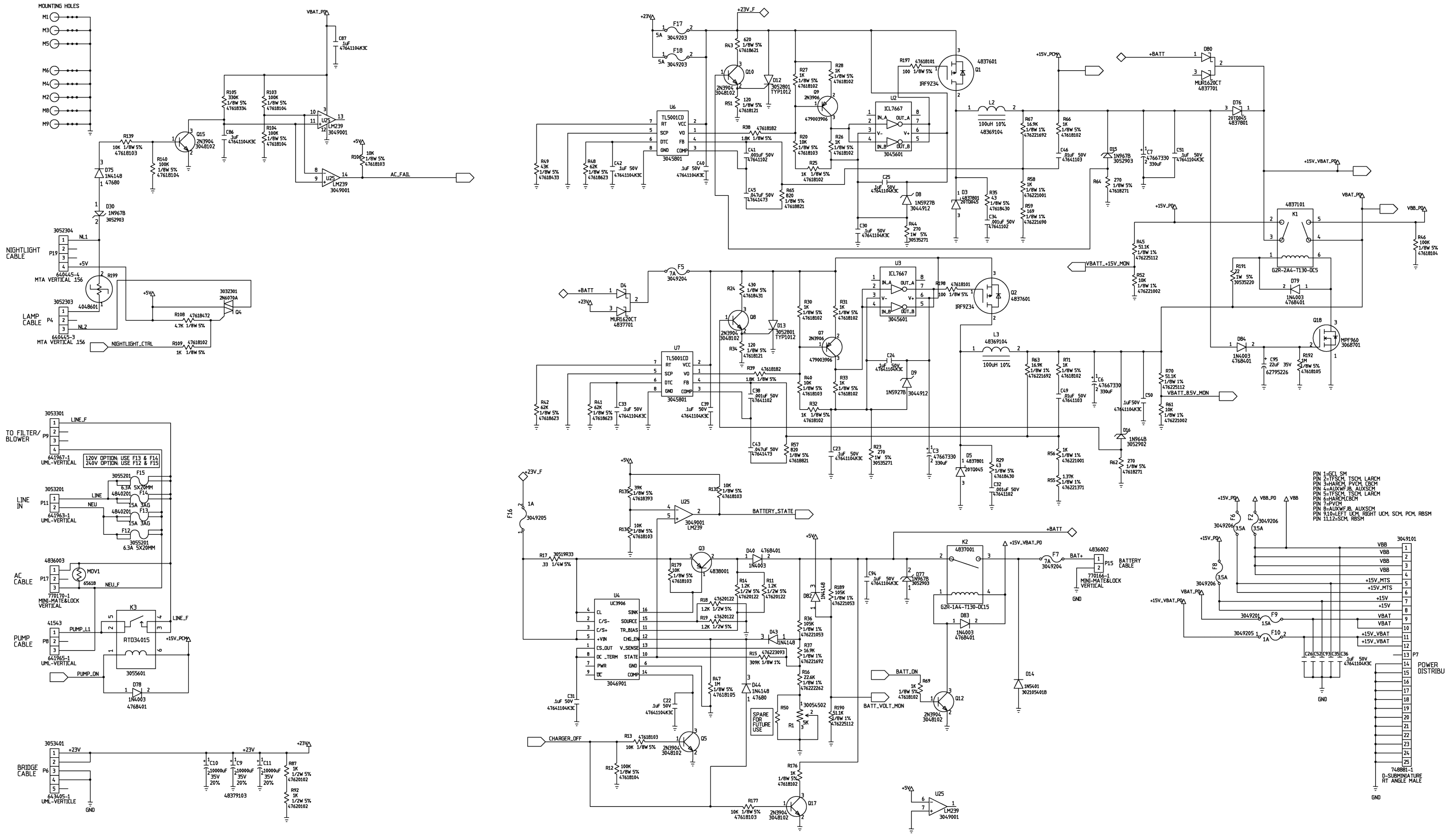
m112c287

P.C. Board Wiring Schematic Diagram—Scale (P/N 47036)


641215-5
P2
P3
P4
P5
4841905
XSIG010457
XSIG010458
XSIG010453
XSIG010454
XSIG010452
XSIG010451
XSIG010455
XSIG010456
-RLY_REF
+RLY_REF
NEG0
POS0
NEG1
POS1
NEG2
POS2
NEG3
POS3
PGND
+5VA
-5VA
Ferrite Bead
4787601
L5
L6
U2
74HC4052
3047001
AIN+
AIN-
AD_REF+
AD_REF-
AGND
DGND
+5VD
U3
CS5516
4771001
Y2
4MHz
3052101
IO(10)
IO(9)
IO(8)
IO(4)
IO(7)
IO(3)
VBB
SMD050
4048602
L2
L3
U5
LM2940CS-5.0
4871401
U1
LM2940CS-5.0
L1
47877103
10uH
U7
3047101
LT1054CS
L4
U6
LM2990CS-5.0
3048501
VCC
NEURON I/O TEST PORT
P6
1-173981-2
4836212
P1
4842008
175487-8
U8
4770075176
LONB
LONA
CP0
CP1
CP2
D4
D5
SA5.0
47681050
U11
X25040S
3045901
U9
MC143150B1
478003150
U10
AM27C256-90
45795256090
Y1
10MHz
3052103
U12
DS1233Z-10
4771312332I0
D1
4792001
RED
U13
4836401
M1
M2
M3
M4
Mounting Holes

P.C. Board Wiring Schematic Diagram—BPCM / Power Supply (P/N 47039) Sheet 1 of 4

2 of 4 3 of 4 4 of 4 Chapter 3


MOUNTING HOLES
M1
M3
M5
M6
M4
M2
M8
M9
VBAT_PD
C87 .1uF 47641104K3C
R105 330K 1/8W 5% 47618334
R103 100K 1/8W 5% 47618104
R104 100K 1/8W 5% 47618104
C86 .1uF 47641104K3C
U25 LM239 3049001
R106 10K 1/8W 5% 47618103
AC_FAIL
R139 10K 1/8W 5% 47618103
Q15 2N3904 3048102
R140 100K 1/8W 5% 47618104
D75 1N4148 47680
D30 1N967B 3052903
NIGHTLIGHT CABLE
P19
3052304
NL1
+5V
640445-4 MTA VERTICAL .156
R199
4048601
3032301 2N6070A
Q4
R108 47618472 4.7K 1/8W 5%
LAMP CABLE
P4
3052303
NL2
640445-3 MTA VERTICAL .156
NIGHTLIGHT_CTRL
R109 47618102 1K 1/8W 5%
TO FILTER/ BLOWER
P9
3053301
LINE_F
641967-1 UML-VERTICAL
120V OPTION: USE F13 & F14
240V OPTION: USE F12 & F15
F15
3055201 6.3A 5X20MM
4840201 F14 15A 3AG
LINE IN
P11
3053201
LINE
NEU
4840201 F13 15A 3AG
F12
3055201 6.3A 5X20MM
641963-1 UML-VERTICAL
AC CABLE
P17
4836003
MOV1
65618
NEU_F
770170-1 MINI-MATE&LOCK VERTICAL
K3
RTD34015
3055601
LINE_F
+15V_PCM
PUMP CABLE
P8
41543
PUMP_L1
641965-1 UML-VERTICAL
PUMP_ON
D78 1N4003 4768401
BRIDGE CABLE
P6
3053401
+23V
643405-1 UML-VERTICLE
GND
C10 10000uF 35V 20%
C9 10000uF 35V 20%
C11 10000uF 35V 20%
48379103
R87 1K 1/2W 5% 47620102
R92 1K 1/2W 5% 47620102
+23V
F17 5A 3049203
F18 5A 3049203
+23V_F
R43 620 1/8W 5% 47618621
Q10 2N3904 3048102
D12 3052801 TYP1012
R51 120 1/8W 5% 47618121
U6 TL5001CD 3045801
RT VCC SCP VO DTC FB GND COMP
R49 43K 1/8W 5% 47618433
R48 62K 1/8W 5% 47618623
C42 .1uF 50V 47641104K3C
C40 .1uF 50V 47641104K3C
R38 47618182 1.8K 1/8W 5%
C41 .001uF 50V 47641102
C45 .047uF 50V 47641473
R65 820 1/8W 5% 47618821
R27 1K 1/8W 5% 47618102
R28 1K 1/8W 5% 47618102
Q9 2N3906 479003906
R20 10K 1/8W 5% 47618103
R26 1K 1/8W 5% 47618102
R25 1K 1/8W 5% 47618102
U2 ICL7667 3045601
IN_A OUT_A V- V+ IN_B OUT_B
C25 .1uF 50V 47641104K3C
C30 .1uF 50V 47641104K3C
D8 1N5927B 3044912
R44 270 1W 5% 30535271
R197 47618101 100 1/8W 5%
Q1 4837601 IRF9Z34
D3 4837801 20TQ045
R35 43 1/8W 5% 47618430
C34 .001uF 50V 47641102
L2 100uH 10% 48369104
R67 16.9K 1/8W 1% 476221692
R66 1K 1/8W 5% 47618102
C46 .01uF 50V 47641103
R58 1K 1/8W 1% 476221001
R59 169 1/8W 1% 476221690
+15V_PCM
D15 1N967B 3052903
R64 270 1/8W 5% 47618271
C7 47667330 330uF
C51 .1uF 50V 47641104K3C
+BATT
D80 MUR1620CT 4837701
D76 20TQ045 4837801
+15V_VBAT_PD
VBAT_PD
VBB_PD
+15V_PD
4837101 K1
R45 51.1K 1/8W 1% 476225112
R52 10K 1/8W 1% 476221002
G2R-2A4-T130-DC5
R191 22 1W 5% 30535220
D79 1N4003 4768401
R46 100K 1/8W 5% 47618104
VBATT_+15V_MON
F5 7A 3049204
+BATT
+23V
D4
D13 3052801 TYP1012
MUR1620CT 4837701
R24 430 1/8W 5% 47618431
Q8 2N3904 3048102
R34 120 1/8W 5% 47618121
U7 TL5001CD 3045801
R42 62K 1/8W 5% 47618623
R41 62K 1/8W 5% 47618623
C33 .1uF 50V 47641104K3C
C39 .1uF 50V 47641104K3C
R39 47618182 1.8K 1/8W 5%
C38 .001uF 50V 47641102
R30 1K 1/8W 5% 47618102
R31 1K 1/8W 5% 47618102
Q7 2N3906 479003906
R40 10K 1/8W 5% 47618103
R33 1K 1/8W 5% 47618102
R32 1K 1/8W 5% 47618102
U3 ICL7667 3045601
C24 .1uF 50V 47641104K3C
D9 1N5927B 3044912
R198 47618101 100 1/8W 5%
Q2 4837601 IRF9Z34
L3 48369104 100uH 10%
R63 16.9K 1/8W 1% 476221692
R71 1K 1/8W 5% 47618102
C49 .01uF 50V 47641103
C6 47667330 330uF
C50 .1uF 50V 47641104K3C
R70 51.1K 1/8W 1% 476225112
VBATT_8.5V_MON
R61 10K 1/8W 1% 476221002
D16 1N964B 3052902
C43 .047uF 50V 47641473
R57 820 1/8W 5% 47618821
C23 .1uF 50V 47641104K3C
R23 270 1W 5% 30535271
C3 47667330 330uF
D5 4837801 20TQ045
R29 43 1/8W 5% 47618430
C32 .001uF 50V 47641102
R56 1K 1/8W 1% 476221001
R55 1.37K 1/8W 1% 476221371
R62 270 1/8W 5% 47618271
D84 1N4003 4768401
C95 22uF 35V 62795226
R192 1M 1/8W 5% 47618105
Q18 MPF960 3068701
+23V_F
F16 1A 3049205
+5V
R135 39K 1/8W 5% 47618393
R136 10K 1/8W 5% 47618103
R137 10K 1/8W 5% 47618103
U25 3049001 LM239
BATTERY_STATE
R17 30519R33 .33 1/4W 5%
Q3 4838001
R179 10K 1/8W 5% 47618103
D40 4768401 1N4003
R14 1.2K 1/2W 5% 47620122
R11 1.2K 1/2W 5% 47620122
R18 47620122 1.2K 1/2W 5%
R19 47620122 1.2K 1/2W 5%
U4 UC3906 3046901
CL SINK C/S- SOURCE C/S+ TR_BIAS +VIN CHG_EN CS_OUT V_SENSE OC_TERM STATE PWR GND OC COMP
C31 .1uF 50V 47641104K3C
C22 .1uF 50V 47641104K3C
D43 1N4148
R15 476223093 309K 1/8W 1%
D82 1N4148
R36 105K 1/8W 1% 476221053
R189 105K 1/8W 1% 476221053
R37 16.9K 1/8W 1% 476221692
R16 22.6K 1/8W 1% 476222262
R47 1M 1/8W 5% 47618105
D44 1N4148 47680
R50 30054502 5K R1
SPARE FOR FUTURE USE
R190 51.1K 1/8W 1% 476225112
C94 .1uF 50V 47641104K3C
D77 1N967B 3052903
K2 4837001
G2R-1A4-T130-DC15
D83 1N4003 4768401
+15V_VBAT_PD
F7 7A 3049204
BAT+
P15 4836002 BATTERY CABLE
770166-1 MINI-MATE&LOCK VERTICAL
GND
D14 1N5401 302105401B
BATT_ON
R69 1K 1/8W 5% 47618102
BATT_VOLT_MON
Q12 2N3904 3048102
CHARGER_OFF
R13 47618103 10K 1/8W 5%
Q5 2N3904 3048102
R12 100K 1/8W 5% 47618104
R176 1K 1/8W 5% 47618102
R177 10K 1/8W 5% 47618103
Q17 2N3904 3048102
U25 LM239 3049001
PIN 1=GCI, SM
PIN 2=TFSCM, TSCM, LARCM
PIN 3=HARCM, PVCM, CBCM
PIN 4=AUXWFJB, AUXSCM
PIN 5=TFSCM, TSCM, LARCM
PIN 6=HARCM,CBCM
PIN 7=PVCM
PIN 8=AUXWFJB, AUXSCM
PIN 9,10=LEFT UCM, RIGHT UCM, SCM, PCM, RBSM
PIN 11,12=SCM, RBSM
+15V_PD VBB_PD VBB
F6 3049206 3.5A
F2 3049206 3.5A
F8 3049206 3.5A
3049101
VBB VBB VBB VBB +15V_MTS +15V_MTS +15V +15V VBAT VBAT +15V_VBAT +15V_VBAT
F9 3049201 1.5A
F10 3049205 1A
C26 C52 C93 C35 C36 .1uF 50V 47641104K3C
P7 POWER DISTRIBUTION
748881-1 D-SUBMINIATURE RT ANGLE MALE
GND

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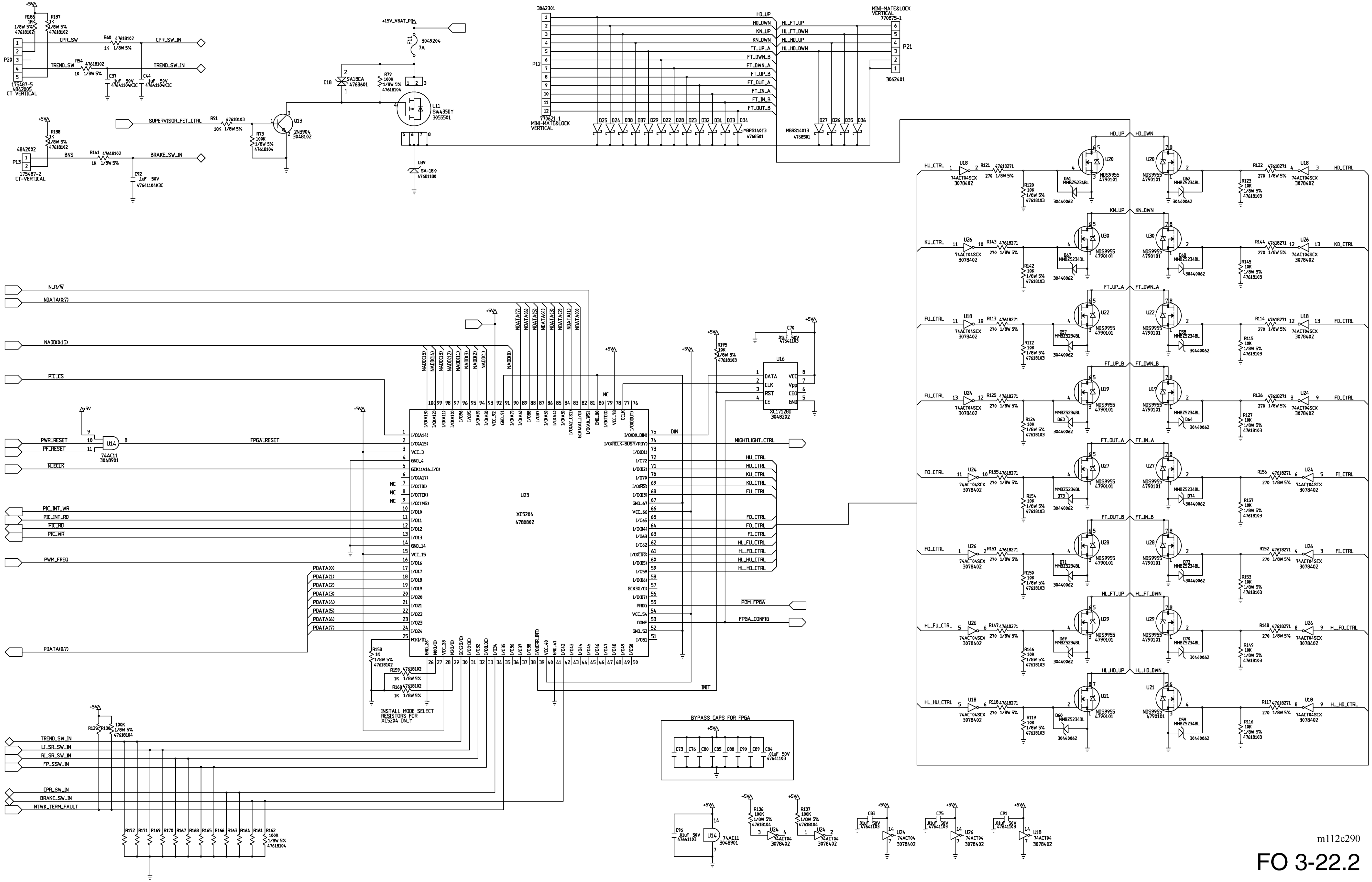
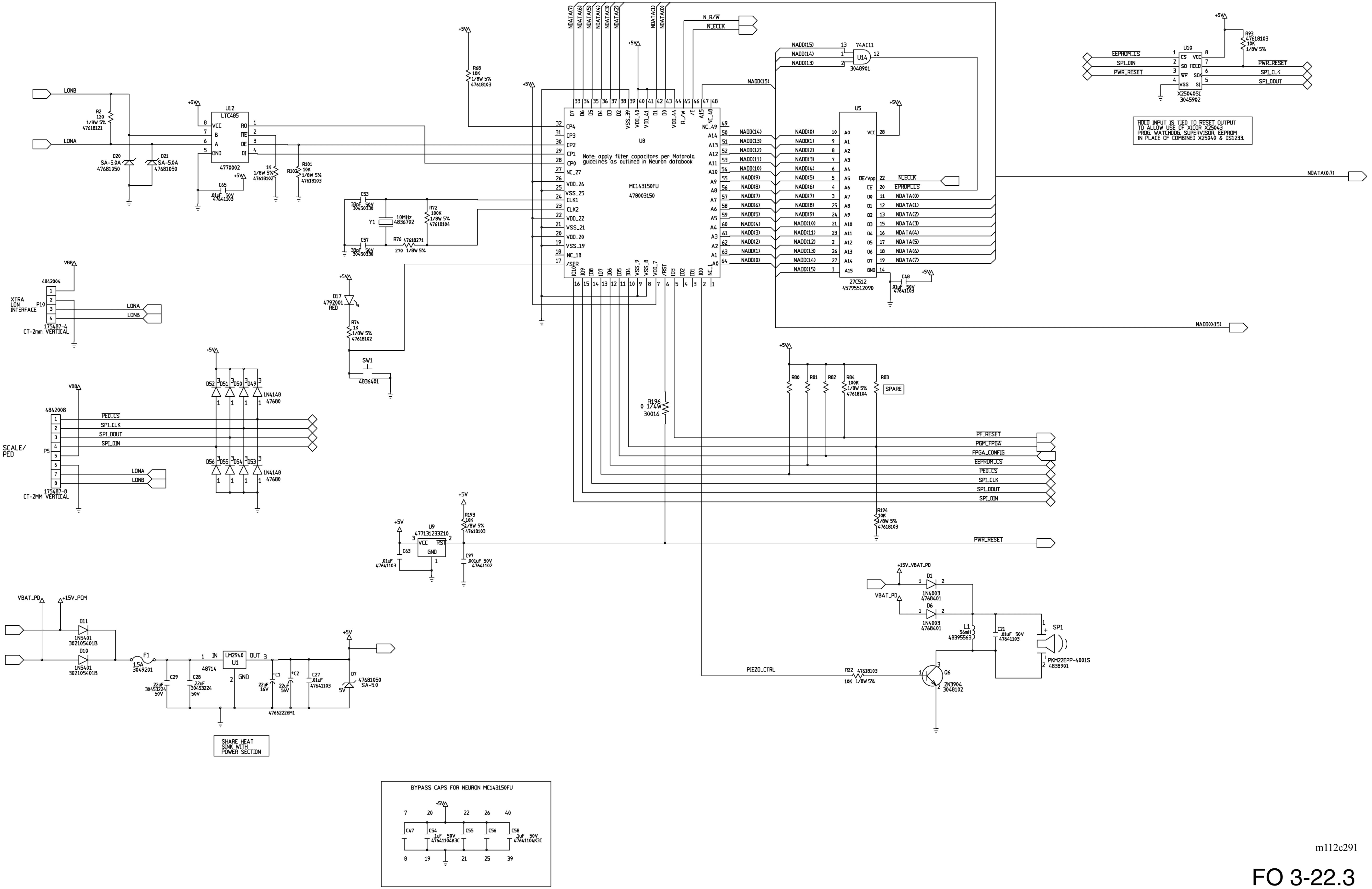
P.C. Board Wiring Schematic Diagram—BPCM / Power Supply (P/N 47039) Sheet 2 of 4


P20
CPR_SW
TREND_SW
CPR_SW_IN
TREND_SW_IN
175487-5
4842005
CT VERTICAL
P13
4842002
BNS
BRAKE_SW_IN
175487-2
CT-VERTICAL
SUPERVISOR_FET_CTRL
Q13
2N3904
3048102
+15V_VBAT_PD
F11
3049204
7A
D18
SA18CA
4768601
U11
SI4435DY
3055501
D39
SA-180
47681180
P12
3062301
770621-1
MINI-MATE&LOCK
VERTICAL
HD_UP
HD_DWN
KN_UP
KN_DWN
FT_UP_A
FT_DWN_B
FT_DWN_A
FT_UP_B
FT_OUT_A
FT_IN_A
FT_IN_B
FT_OUT_B
MBRS140T3
4768501
P21
MINI-MATE&LOCK
VERTICAL
770875-1
3062401
HL_FT_UP
HL_FT_DWN
HL_HD_UP
HL_HD_DWN
N_R/W
NDATA(0:7)
NADD(0:15)
PIC_CS
PWR_RESET
PF_RESET
U14
74AC11
3048901
FPGA_RESET
N_ECLK
PIC_INT_WR
PIC_INT_RD
PIC_RD
PIC_WR
PWM_FREQ
PDATA(0:7)
U23
XC5204
4780802
U16
XC17128D
3048202
NIGHTLIGHT_CTRL
HU_CTRL
HD_CTRL
KU_CTRL
KD_CTRL
FU_CTRL
FD_CTRL
FI_CTRL
HL_FU_CTRL
HL_FD_CTRL
HL_HU_CTRL
HL_HD_CTRL
PGM_FPGA
FPGA_CONFIG
INIT
INSTALL MODE SELECT
RESISTORS FOR
XC5204 ONLY
TREND_SW_IN
LI_SR_SW_IN
RI_SR_SW_IN
FP_SSW_IN
CPR_SW_IN
BRAKE_SW_IN
NTWK_TERM_FAULT
BYPASS CAPS FOR FPGA
NDS9955
4790101
74ACT04SCX
3078402
MMBZ5234BL
30440062
74ACT04
m112c290

P.C. Board Wiring Schematic Diagram—BPCM / Power Supply (P/N 47039) Sheet 3 of 4

1 of 4 2 of 4 4 of 4



U8
MC143150FU
478003150
Note: apply filter capacitors per Motorola guidelines as outlined in Neuron databook
U12
LTC485
4770002
LONB
LONA
R2 120 1/8W 5% 47618121
D20 SA-5.0A 47681050
D21 SA-5.0A 47681050
C65 .01uF 50V 47641103
R101 10K 1/8W 5% 47618103
R68 10K 1/8W 5% 47618103
C53 33pF 50V 30450330
C57 33pF 50V 30450330
Y1 10MHz 48036702
R72 100K 1/8W 5% 47618104
R76 47618271 270 1/8W 5%
D17 4792001 RED
R74 1K 1/8W 5% 47618102
SW1 4836401
XTRA LON INTERFACE P10
4842004
175487-4 CT-2mm VERTICAL
VBB
SCALE/ PED P5
4842008
175487-8 CT-2MM VERTICAL
PED_CS
SPI_CLK
SPI_DOUT
SPI_DIN
D52 D51 D50 D49 1N4148 47680
D56 D55 D54 D53 1N4148 47680
R196 0 1/4W 30016
U9 477131233Z10
C63 .01uF 47641103
R193 10K 1/8W 5% 47618103
C97 .001uF 50V 47641102
PWR_RESET
VBAT_PD
+15V_PCM
D11 1N5401 302105401B
D10 1N5401 302105401B
F1 1.5A 3049201
U1 LM2940 48714
C29 22uF 30453224 50V
C28 22uF 30453224 50V
C1 22uF 16V
C2 22uF 16V
C27 .01uF 47641103
D7 47681050 SA-5.0
47662226M1
SHARE HEAT SINK WITH POWER SECTION
BYPASS CAPS FOR NEURON MC143150FU
C47 C54 C55 C56 C58 .1uF 50V 47641104K3C
U14 74AC11 3048901
NADD(15) NADD(14) NADD(13)
U5 27C512 45795512090
C48 .01uF 50V 47641103
NDATA(0:7)
NADD(0:15)
N_R/W
N_ECLK
EPROM_CS
R80 R81 R82 R84 100K 1/8W 5% 47618104 R83 SPARE
PF_RESET
PGM_FPGA
FPGA_CONFIG
EEPROM_CS
R194 10K 1/8W 5% 47618103
U10 X25040SI 3045902
R93 47618103 10K 1/8W 5%
SPI_DIN
HOLD INPUT IS TIED TO RESET OUTPUT TO ALLOW USE OF XICOR X25043 PROG. WATCHDOG, SUPERVISOR, EEPROM IN PLACE OF COMBINED X25040 & DS1233.
+15V_VBAT_PD
D1 1N4003 4768401
D6 1N4003 4768401
L1 56mH 48395563
C21 .01uF 50V 47641103
SP1 PKM22EPP-4001S 4838901
PIEZO_CTRL
R22 47618103 10K 1/8W 5%
Q6 2N3904 3048102
+5V

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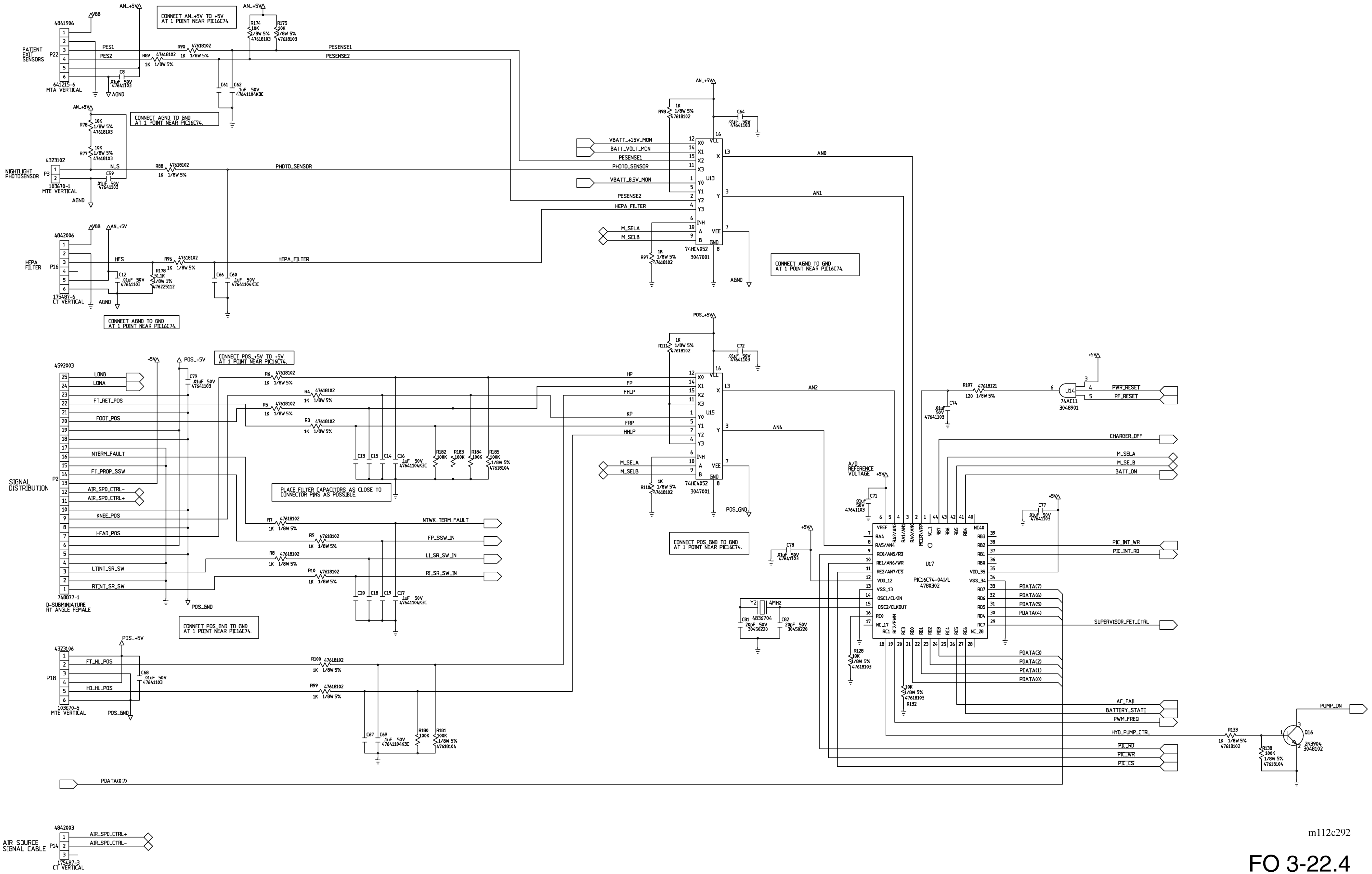
P.C. Board Wiring Schematic Diagram—BPCM / Power Supply (P/N 47039) Sheet 4 of 4

1 of 4 2 of 4 3 of 4 Chapter 3


CONNECT AN_+5V TO +5V AT 1 POINT NEAR PIC16C74.
CONNECT AGND TO GND AT 1 POINT NEAR PIC16C74.
CONNECT POS_+5V TO +5V AT 1 POINT NEAR PIC16C74.
CONNECT POS_GND TO GND AT 1 POINT NEAR PIC16C74.
PLACE FILTER CAPACITORS AS CLOSE TO CONNECTOR PINS AS POSSIBLE.
PATIENT EXIT SENSORS
P22
4841906
641215-6 MTA VERTICAL
PES1
PES2
PESENSE1
PESENSE2
NIGHTLIGHT PHOTOSENSOR
P3
4323102
103670-1 MTE VERTICAL
NLS
PHOTO_SENSOR
HEPA FILTER
P16
4842006
175487-6 CT VERTICAL
HFS
HEPA_FILTER
AGND
VBB
AN_+5V
SIGNAL DISTRIBUTION
P2
4592003
748877-1 D-SUBMINIATURE RT ANGLE FEMALE
LONB
LONA
FT_RET_POS
FOOT_POS
NTERM_FAULT
FT_PROP_SSW
AIR_SPD_CTRL-
AIR_SPD_CTRL+
KNEE_POS
HEAD_POS
LTINT_SR_SW
RTINT_SR_SW
POS_+5V
POS_GND
NTWK_TERM_FAULT
FP_SSW_IN
LI_SR_SW_IN
RI_SR_SW_IN
P18
4323106
103670-5 MTE VERTICAL
FT_HL_POS
HD_HL_POS
AIR SOURCE SIGNAL CABLE
P14
4842003
175487-3 CT VERTICAL
AIR_SPD_CTRL+
AIR_SPD_CTRL-
PDATA(0:7)
U13
74HC4052
3047001
VBATT_+15V_MON
BATT_VOLT_MON
PESENSE1
PHOTO_SENSOR
VBATT_8.5V_MON
PESENSE2
HEPA_FILTER
M_SELA
M_SELB
AN0
AN1
U15
74HC4052
3047001
HP
FP
FHLP
KP
FRP
HHLP
AN2
AN4
U17
PIC16C74-041/L
4780302
A/D REFERENCE VOLTAGE
Y2
4MHz
4836704
U14
74AC11
3048901
PWR_RESET
PF_RESET
CHARGER_OFF
M_SELA
M_SELB
BATT_ON
PIC_INT_WR
PIC_INT_RD
PDATA(7)
PDATA(6)
PDATA(5)
PDATA(4)
SUPERVISOR_FET_CTRL
PDATA(3)
PDATA(2)
PDATA(1)
PDATA(0)
AC_FAIL
BATTERY_STATE
PWM_FREQ
HYD_PUMP_CTRL
PIC_RD
PIC_WR
PIC_CS
PUMP_ON
Q16
2N3904
3048102
R133
R138
R128
R132
R107
C77
C78
C81
C82
C71
C74

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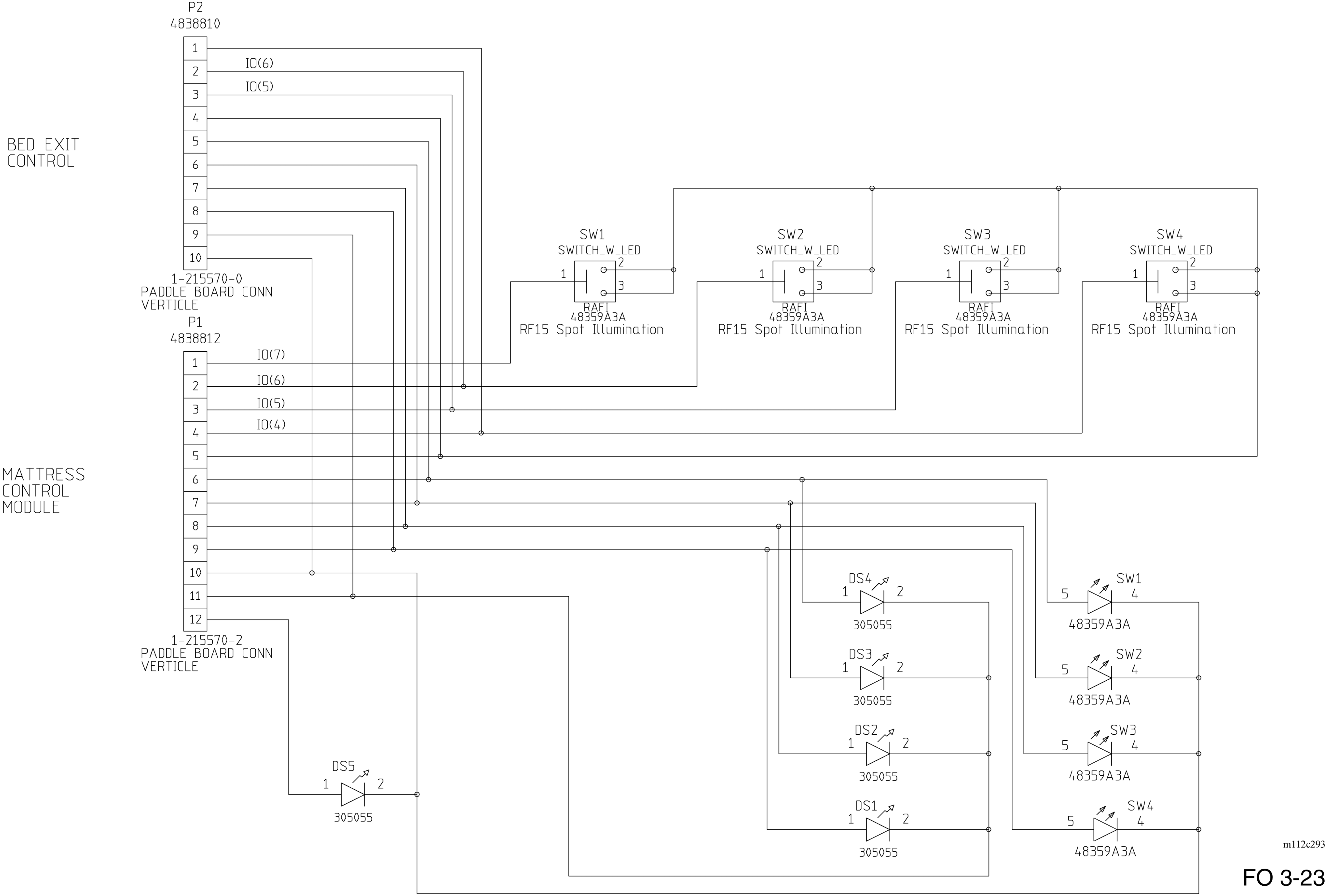
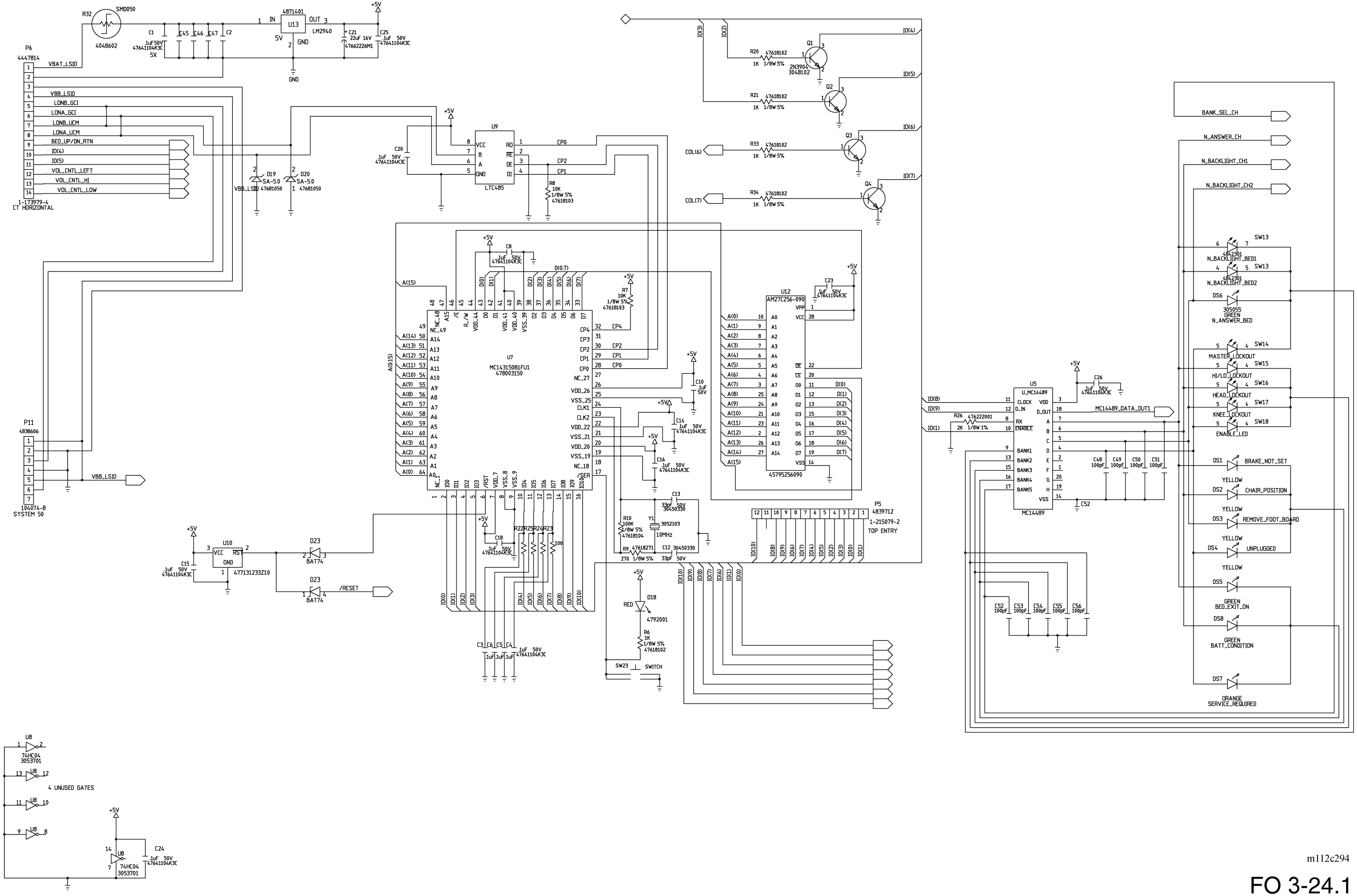
P.C. Board Wiring Schematic Diagram—Bed Exit Detect/Mattress Control (P/N 47054)


P2
4838810
IO(6)
IO(5)
BED EXIT CONTROL
1-215570-0
PADDLE BOARD CONN
VERTICLE
P1
4838812
IO(7)
IO(6)
IO(5)
IO(4)
MATTRESS CONTROL MODULE
1-215570-2
PADDLE BOARD CONN
VERTICLE
SW1
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW2
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW3
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
SW4
SWITCH_W_LED
RAFI
48359A3A
RF15 Spot Illumination
DS4
305055
DS3
305055
DS2
305055
DS1
305055
DS5
305055
SW1
48359A3A
SW2
48359A3A
SW3
48359A3A
SW4
48359A3A
m112c293

P.C. Board Wiring Schematic Diagram—Right Side User Control Module (P/N 47355) Sheet 1 of 2


R32
SMD050
4048602
4871401
U13
LM2940
IN
OUT
GND
5V
+5V
C1
C45
C46
C47
C2
.1uF 50V
47641104K3C
5X
C21
22uF 16V
47662226M1
C25
.1uF 50V
47641104K3C
P6
4447814
VBAT_LSID
VBB_LSID
LONB_GCI
LONA_GCI
LONB_UCM
LONA_UCM
BED_UP/DN_RTN
IO(4)
IO(5)
VOL_CNTL_LEFT
VOL_CNTL_HI
VOL_CNTL_LOW
1-173979-4
CT HORIZONTAL
D19
SA-5.0
47681050
D20
SA-5.0
47681050
VBB_LSID
C20
.1uF 50V
47641104K3C
U9
LTC485
VCC
B
A
GND
RO
RE
DE
DI
CP0
CP2
CP1
R8
10K
1/8W 5%
47618103
IO(3)
IO(2)
IO(4)
IO(5)
IO(6)
IO(7)
R20
47618102
1K 1/8W 5%
Q1
2N3904
3048102
R21
47618102
1K 1/8W 5%
Q2
COL(6)
R33
47618102
1K 1/8W 5%
Q3
COL(7)
R34
47618102
1K 1/8W 5%
Q4
BANK_SEL_CH
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
SW13
4842301
N_BACKLIGHT_BED1
N_BACKLIGHT_BED2
DS6
305055
GREEN
N_ANSWER_BED
SW14
MASTER_LOCKOUT
SW15
HI/LO_LOCKOUT
SW16
HEAD_LOCKOUT
SW17
KNEE_LOCKOUT
SW18
ENABLE_LED
C8
.1uF 50V
47641104K3C
D(0:7)
R7
10K
1/8W 5%
47618103
A(15)
A(0:15)
U7
MC143150B1FU1
478003150
C23
.1uF 50V
47641104K3C
U12
AM27C256-090
45795256090
VPP
VCC
OE
CE
VSS
C10
.1uF 50V
C14
.1uF 50V
47641104K3C
C16
.1uF 50V
47641104K3C
U5
U_MC14489
MC14489
CLOCK
D_IN
RX
ENABLE
D_OUT
BANK1
BANK2
BANK3
BANK4
BANK5
C26
.1uF 50V
47641104K3C
MC14489_DATA_OUT1
R26
476222001
2K 1/8W 1%
IO(8)
IO(9)
IO(1)
C48
C49
C50
C51
100pF
C52
DS1
BRAKE_NOT_SET
YELLOW
DS2
CHAIR_POSITION
DS3
REMOVE_FOOT_BOARD
DS4
UNPLUGGED
DS5
GREEN
BED_EXIT_ON
DS8
BATT_CONDITION
DS7
ORANGE
SERVICE_REQUIRED
P11
4838606
VBB_LSID
104074-8
SYSTEM 50
C13
33pF 50V
30450330
R10
100K
1/8W 5%
47618104
Y1
3052103
10MHz
R9
47618271
270 1/8W 5%
C12
30450330
33pF 50V
P5
4839712
1-215079-2
TOP ENTRY
+5V
U10
4771312332I0
VCC
RST
GND
C15
.1uF 50V
47641104K3C
D23
BAT74
/RESET
C18
.1uF 50V
47641104K3C
R22 R25 R24 R23
100
D18
RED
4792001
R6
1K
1/8W 5%
47618102
SW23
SWITCH
C3
C6
C5
C4
1uF
.1uF 50V
47641104K3C
C52
C53
C54
C55
C56
100pF
U8
74HC04
3053701
4 UNUSED GATES
C24
.1uF 50V
47641104K3C

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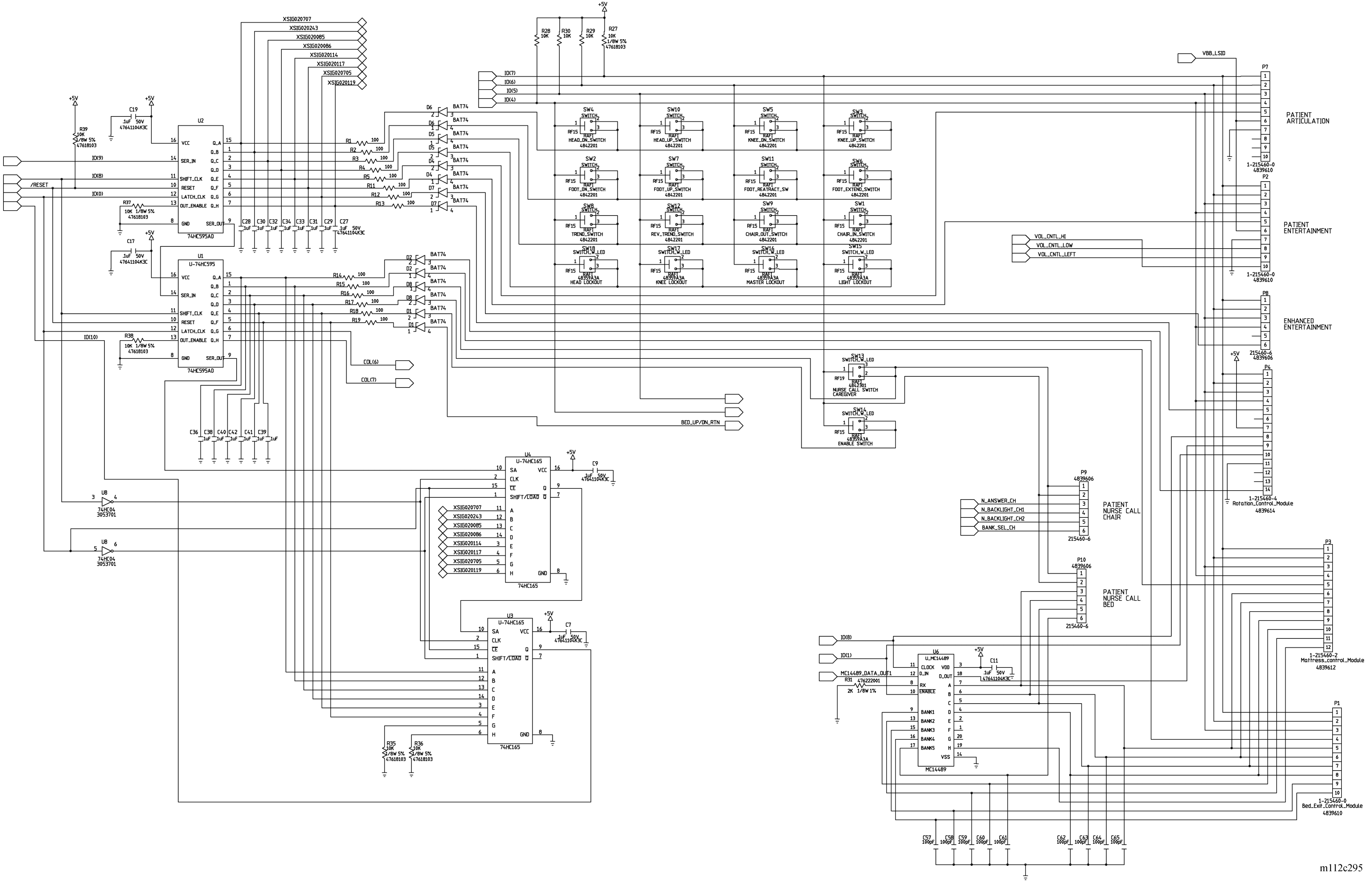
P.C. Board Wiring Schematic Diagram—Right Side User Control Module (P/N 47355) Sheet 2 of 2


+5V
XSIG020707
XSIG020243
XSIG020085
XSIG020086
XSIG020114
XSIG020117
XSIG020705
XSIG020119
R28 10K
R30 10K
R29 10K
R27 10K 1/8W 5% 47618103
IO(7)
IO(6)
IO(5)
IO(4)
IO(9)
IO(8)
IO(0)
/RESET
IO(10)
R39 10K 1/8W 5% 47618103
C19 .1uF 50V 47641104K3C
U2
74HC595AD
VCC
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
GND
SER_OUT
Q_A
Q_B
Q_C
Q_D
Q_E
Q_F
Q_G
Q_H
R37 10K 1/8W 5% 47618103
C17 .1uF 50V 47641104K3C
U1
U-74HC595
R38 10K 1/8W 5% 47618103
C28 C30 C32 C34 C33 C31 C29 C27
.1uF
C36 C38 C40 C42 C41 C39
R1 R2 R3 R4 R5 R11 R12 R13 100
R14 R15 R16 R17 R18 R19 100
D1 D2 D3 D4 D5 D6 D7 D8
BAT74
COL(6)
COL(7)
BED_UP/DN_RTN
SW4 SWITCH RF15 RAFI HEAD_DN_SWITCH 4842201
SW10 SWITCH RF15 RAFI HEAD_UP_SWITCH 4842201
SW5 SWITCH RF15 RAFI KNEE_DN_SWITCH 4842201
SW3 SWITCH RF15 RAFI KNEE_UP_SWITCH 4842201
SW2 SWITCH RF15 RAFI FOOT_DN_SWITCH 4842201
SW7 SWITCH RF15 RAFI FOOT_UP_SWITCH 4842201
SW11 SWITCH RF15 RAFI FOOT_RETRACT_SW 4842201
SW6 SWITCH RF15 RAFI FOOT_EXTEND_SWITCH 4842201
SW8 SWITCH RF15 RAFI TREND_SWITCH 4842201
SW12 SWITCH RF15 RAFI REV_TREND_SWITCH 4842201
SW9 SWITCH RF15 RAFI CHAIR_OUT_SWITCH 4842201
SW1 SWITCH RF15 RAFI CHAIR_IN_SWITCH 4842201
SW18 SWITCH_W_LED RF15 RAFI 48359A3A HEAD LOCKOUT
SW17 SWITCH_W_LED RF15 RAFI 48359A3A KNEE LOCKOUT
SW16 SWITCH_W_LED RF15 RAFI 48359A3A MASTER LOCKOUT
SW15 SWITCH_W_LED RF15 RAFI 48359A3A LIGHT LOCKOUT
SW13 SWITCH_W_LED RF19 RAFI 4842301 NURSE CALL SWITCH CAREGIVER
SW14 SWITCH_W_LED RF15 RAFI 48359A3A ENABLE SWITCH
VBB_LSID
P7 1-215460-0 4839610 PATIENT ARTICULATION
P2 1-215460-0 4839610 PATIENT ENTERTAINMENT
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
P8 215460-6 4839606 ENHANCED ENTERTAINMENT
P4 1-215460-4 Rotation_Control_Module 4839614
P9 4839606 215460-6 PATIENT NURSE CALL CHAIR
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
BANK_SEL_CH
P10 4839606 215460-6 PATIENT NURSE CALL BED
P3 1-215460-2 Mattress_control_Module 4839612
P1 1-215460-0 Bed_Exit_Control_Module 4839610
U8 74HC04 3053701
U4 U-74HC165 74HC165
U3 U-74HC165 74HC165
SA CLK CE SHIFT/LOAD VCC Q GND A B C D E F G H
C9 .1uF 50V 47641104K3C
C7 .1uF 50V 47641104K3C
R35 10K 1/8W 5% 47618103
R36 10K 1/8W 5% 47618103
U6 U_MC14489 MC14489
CLOCK D_IN RX ENABLE VDD D_OUT BANK1 BANK2 BANK3 BANK4 BANK5 VSS
C11 .1uF 50V 47641104K3C
IO(8)
IO(1)
MC14489_DATA_OUT1
R31 476222001 2K 1/8W 1%
C57 C58 C59 C60 C61 C62 C63 C64 C65 100pF

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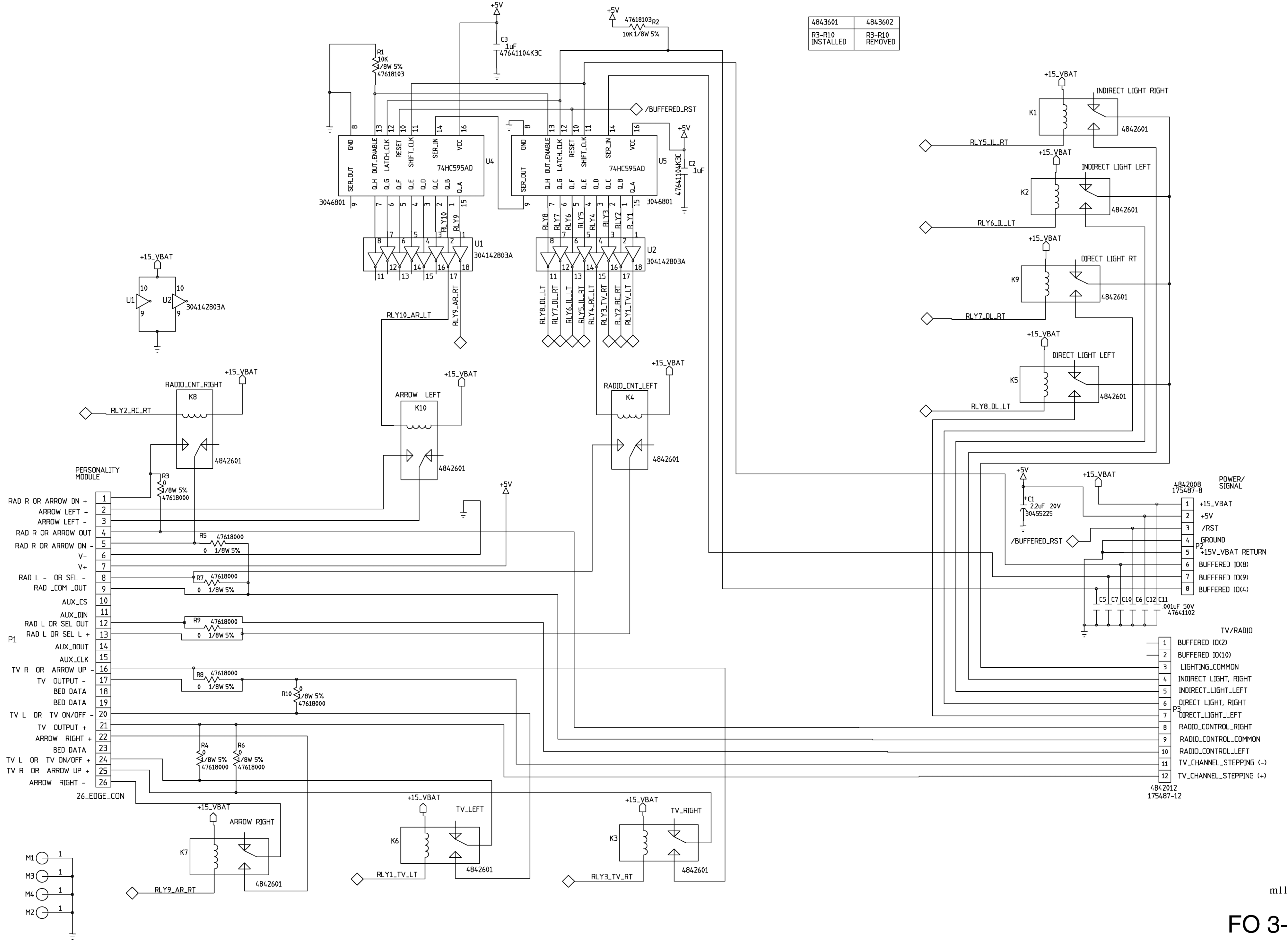
P.C. Board Wiring Schematic Diagram—Entertainment Lighting Board (P/N 48434)


+5V
C3
.1uF
47641104K3C
R1
10K
1/8W 5%
47618103
+5V
47618103
R2
10K 1/8W 5%
/BUFFERED_RST
+5V
C2
.1uF
47641104K3C
GND
OUT_ENABLE
LATCH_CLK
RESET
SHIFT_CLK
SER_IN
VCC
74HC595AD
U4
SER_OUT
Q_H
Q_G
Q_F
Q_E
Q_D
Q_C
Q_B
Q_A
3046801
U5
3046801
RLY10
RLY9
RLY8
RLY7
RLY6
RLY5
RLY4
RLY3
RLY2
RLY1
U1
304142803A
U2
304142803A
RLY10_AR_LT
RLY9_AR_RT
RLY8_DL_LT
RLY7_DL_RT
RLY6_IL_LT
RLY5_IL_RT
RLY4_RC_LT
RLY3_TV_RT
RLY2_RC_RT
RLY1_TV_LT
+15_VBAT
U1
U2
304142803A
4843601
4843602
R3-R10 INSTALLED
R3-R10 REMOVED
+15_VBAT
INDIRECT LIGHT RIGHT
K1
4842601
RLY5_IL_RT
+15_VBAT
INDIRECT LIGHT LEFT
K2
4842601
RLY6_IL_LT
+15_VBAT
DIRECT LIGHT RT
K9
4842601
RLY7_DL_RT
+15_VBAT
DIRECT LIGHT LEFT
K5
4842601
RLY8_DL_LT
+15_VBAT
RADIO_CNT_RIGHT
K8
RLY2_RC_RT
4842601
+15_VBAT
ARROW LEFT
K10
4842601
+15_VBAT
RADIO_CNT_LEFT
K4
4842601
PERSONALITY MODULE
R3
0
1/8W 5%
47618000
R5
47618000
0 1/8W 5%
R7
47618000
0 1/8W 5%
R9
47618000
0 1/8W 5%
R8
47618000
0 1/8W 5%
R10
0
1/8W 5%
47618000
R4
0
1/8W 5%
47618000
R6
0
1/8W 5%
47618000
+5V
P1
1 RAD R OR ARROW DN +
2 ARROW LEFT +
3 ARROW LEFT -
4 RAD R OR ARROW OUT
5 RAD R OR ARROW DN -
6 V-
7 V+
8 RAD L - OR SEL -
9 RAD _COM _OUT
10 AUX_CS
11 AUX_DIN
12 RAD L OR SEL OUT
13 RAD L OR SEL L +
14 AUX_DOUT
15 AUX_CLK
16 TV R OR ARROW UP -
17 TV OUTPUT -
18 BED DATA
19 BED DATA
20 TV L OR TV ON/OFF -
21 TV OUTPUT +
22 ARROW RIGHT +
23 BED DATA
24 TV L OR TV ON/OFF +
25 TV R OR ARROW UP +
26 ARROW RIGHT -
26_EDGE_CON
+5V
+15_VBAT
C1
2.2uF 20V
30455225
/BUFFERED_RST
4842008
175487-8
POWER/ SIGNAL
P2
1 +15_VBAT
2 +5V
3 /RST
4 GROUND
5 +15V_VBAT RETURN
6 BUFFERED IO(8)
7 BUFFERED IO(9)
8 BUFFERED IO(4)
C5
C7
C10
C6
C12
C11
.001uF 50V
47641102
TV/RADIO
P3
1 BUFFERED IO(2)
2 BUFFERED IO(10)
3 LIGHTING_COMMON
4 INDIRECT LIGHT, RIGHT
5 INDIRECT_LIGHT_LEFT
6 DIRECT LIGHT, RIGHT
7 DIRECT_LIGHT_LEFT
8 RADIO_CONTROL_RIGHT
9 RADIO_CONTROL_COMMON
10 RADIO_CONTROL_LEFT
11 TV_CHANNEL_STEPPING (-)
12 TV_CHANNEL_STEPPING (+)
4842012
175487-12
+15_VBAT
ARROW RIGHT
K7
RLY9_AR_RT
4842601
+15_VBAT
TV_LEFT
K6
RLY1_TV_LT
4842601
+15_VBAT
TV_RIGHT
K3
RLY3_TV_RT
4842601
M1
M3
M4
M2
1

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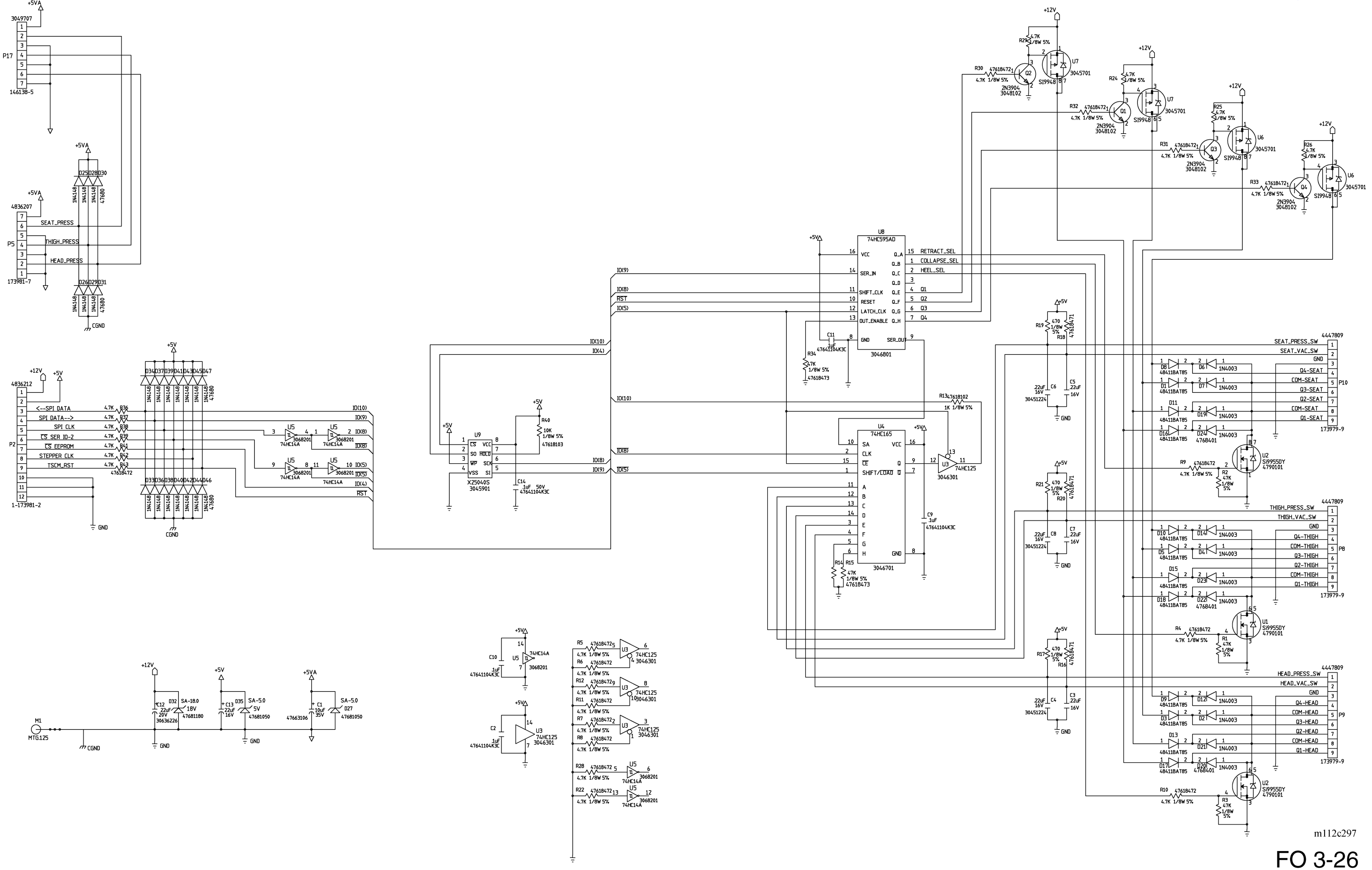
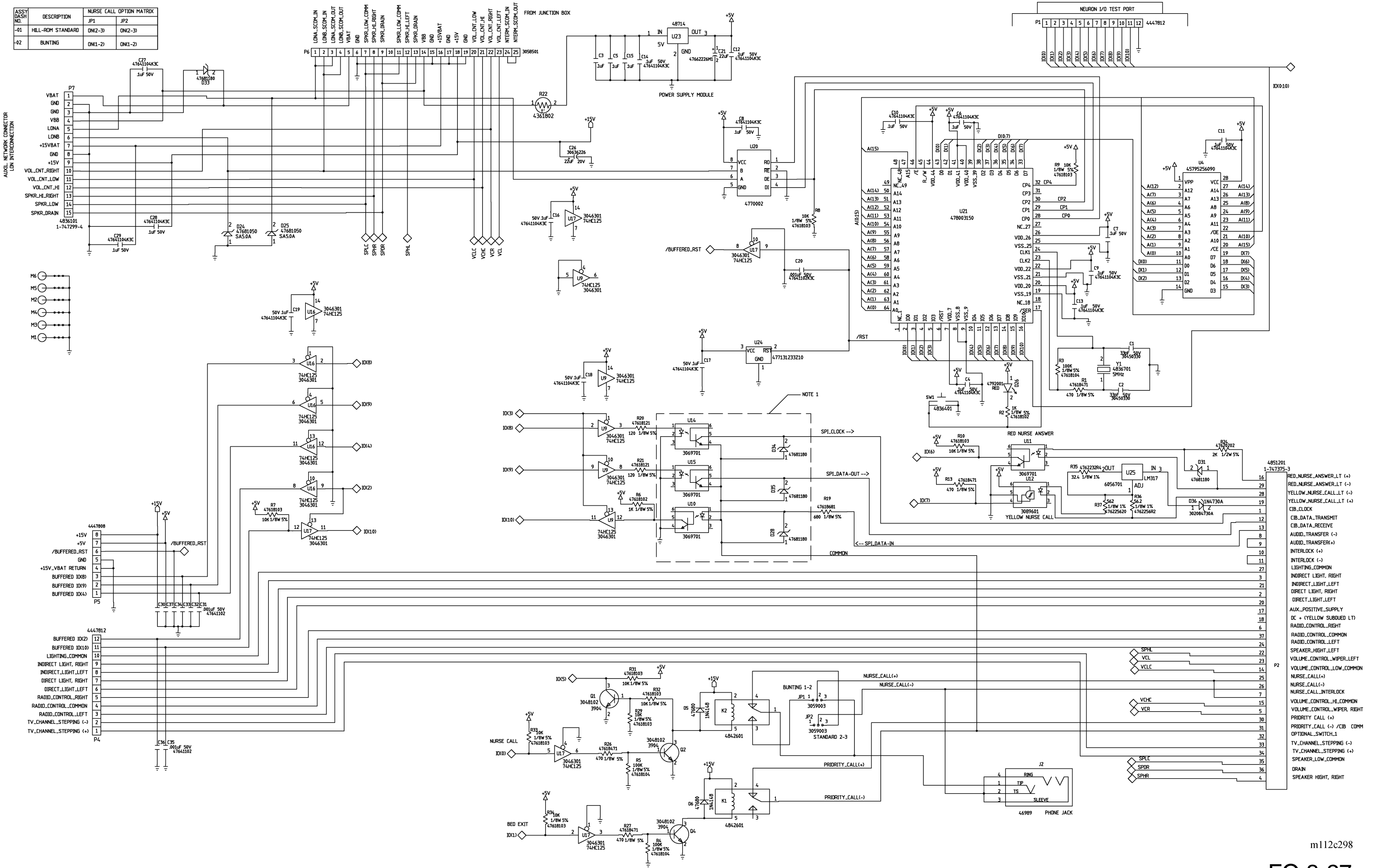
P.C. Board Wiring Schematic Diagram—Treatment Surface Control Module (P/N 48522)


+5VA
3049707
P17
146138-5
4836207
P5
SEAT_PRESS
THIGH_PRESS
HEAD_PRESS
173981-7
D25 D28 D30
D26 D29 D31
1N4148
47680
CGND
4836212
P2
<--SPI DATA
SPI DATA-->
SPI CLK
CS SER ID-2
CS EEPROM
STEPPER CLK
TSCM_RST
1-173981-2
GND
R36 R37 R38 R39 R41 R42 R43
4.7K
47618472
D34 D37 D39 D41 D43 D45 D47
D33 D36 D38 D40 D42 D44 D46
U5
74HC14A
3068201
IO(10)
IO(9)
IO(8)
IO(5)
IO(4)
RST
U9
X25040S
3045901
CS SO WP VSS VCC HOLD SCK SI
R40
10K 1/8W 5%
47618103
C14
.1uF 50V
47641104K3C
U8
74HC595AD
VCC SER_IN SHIFT_CLK RESET LATCH_CLK OUT_ENABLE GND
Q_A Q_B Q_C Q_D Q_E Q_F Q_G Q_H SER_OUT
RETRACT_SEL
COLLAPSE_SEL
HEEL_SEL
Q1 Q2 Q3 Q4
3046801
C11
R34
47K 1/8W 5%
47618473
U4
74HC165
SA CLK LE SHIFT/LOAD A B C D E F G H VCC Q GND
3046701
R14 R15
C9
R13 47618102
1K 1/8W 5%
U3
74HC125
3046301
+12V
R29 R30 R32 R24 R31 R25 R33 R26
Q1 Q2 Q3 Q4
2N3904
3048102
U7 U6
SI9948
3045701
R19 R18 R21 R20 R17 R16
470 1/8W 5%
47618471
C6 C5 C8 C7 C4 C3
22uF 16V
30451224
4447809
SEAT_PRESS_SW
SEAT_VAC_SW
GND
Q4-SEAT
COM-SEAT
Q3-SEAT
Q2-SEAT
COM-SEAT
Q1-SEAT
P10
173979-9
THIGH_PRESS_SW
THIGH_VAC_SW
Q4-THIGH
COM-THIGH
Q3-THIGH
Q2-THIGH
COM-THIGH
Q1-THIGH
P8
HEAD_PRESS_SW
HEAD_VAC_SW
Q4-HEAD
COM-HEAD
Q3-HEAD
Q2-HEAD
COM-HEAD
Q1-HEAD
P9
48411BAT85
1N4003
4768401
U2 U1
SI9955DY
4790101
R9 R4 R10
R1 R2 R3
47K 1/8W 5%
C10
C2
47641104K3C
R5 R6 R12 R11 R7 R8 R28 R22
M1
MTG125
CGND
C12 22uF 20V
30636226
D32 SA-18.0 18V
47681180
C13 22uF 16V
D35 SA-5.0 5V
47681050
C1 10uF 35V
47663106
D27 SA-5.0
m112c297

P.C. Board Wiring Schematic Diagram—SideCom® Communication System Module (P/N 47374)

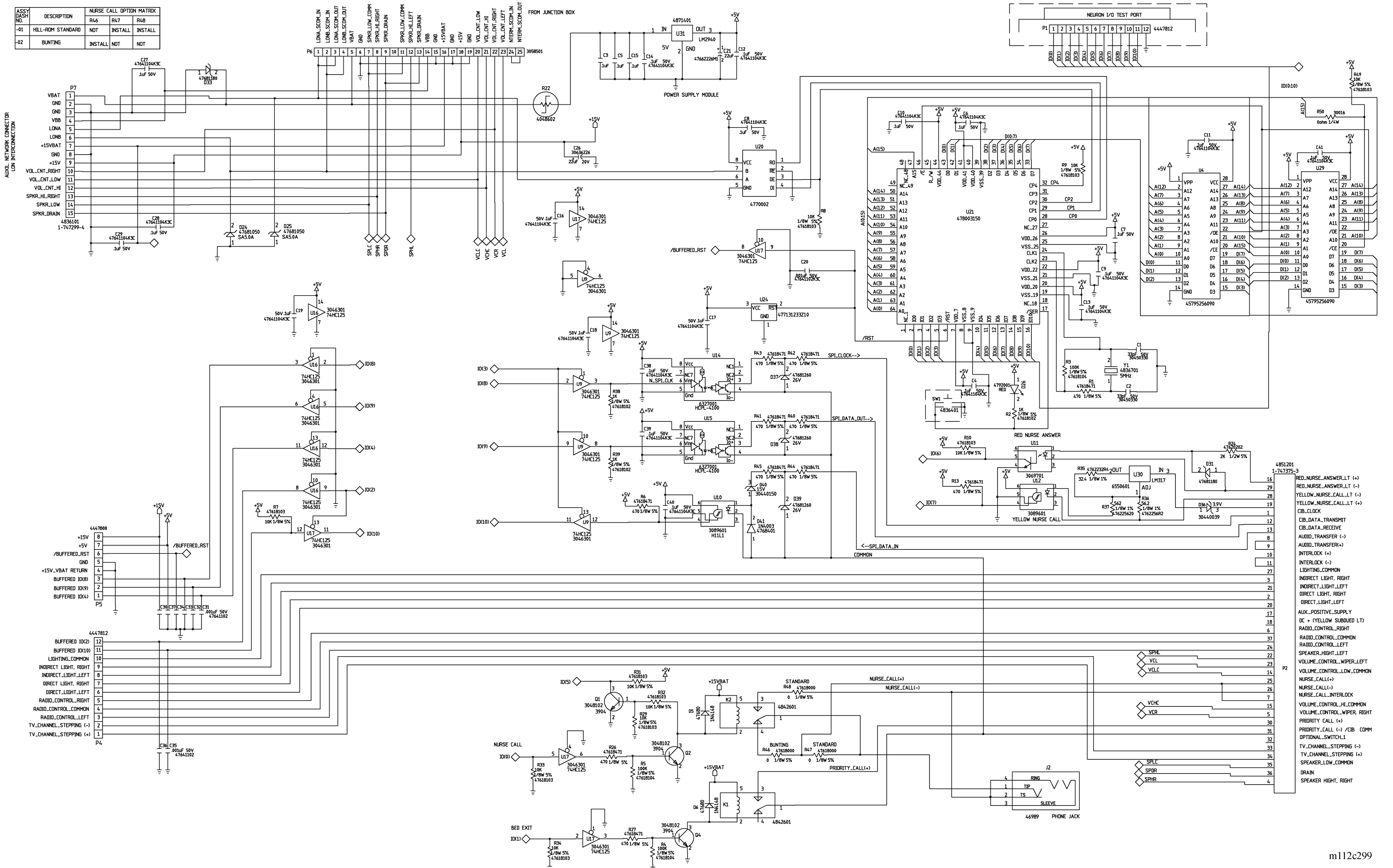


ASSY DASH NO.	DESCRIPTION	NURSE CALL OPTION MATRIX	
		JP1	JP2
-01	HILL-ROM STANDARD	ON(2-3)	ON(2-3)
-02	BUNTING	ON(1-2)	ON(1-2)

FROM JUNCTION BOX
P6 3058501
LONA_SCOM_IN
LONB_SCOM_IN
LONA_SCOM_OUT
LONB_SCOM_OUT
VBAT
GND
SPKR_LOW_COMM
SPKR_HI_RIGHT
SPKR_DRAIN
SPKR_LOW_COMM
SPKR_HI_LEFT
SPKR_DRAIN
VBB
GND
+15VBAT
GND
+15V
GND
VOL_CNT_LOW
VOL_CNT_HI
VOL_CNT_RIGHT
VOL_CNT_LEFT
NTERM_SCOM_IN
NTERM_SCOM_OUT
AUXIL NETWORK CONNECTOR
LON INTERCONNECTION
P7
VBAT
GND
GND
VBB
LONA
LONB
+15VBAT
GND
+15V
VOL_CNT_RIGHT
VOL_CNT_LOW
VOL_CNT_HI
SPKR_HI_RIGHT
SPKR_LOW
SPKR_DRAIN
4836101
1-747299-4
R22
4361802
POWER SUPPLY MODULE
U23
48714
IN
OUT
GND
5V
NEURON I/O TEST PORT
P1
4447812
IO(0:10)
U20
4770002
U21
478003150
U4
45795256090
U24
477131233Z10
SW1
4836401
Y1
4836701
5MHz
NOTE 1
SPI_CLOCK -->
SPI_DATA-OUT -->
<-- SPI_DATA-IN
COMMON
/RST
/BUFFERED_RST
RED NURSE ANSWER
YELLOW NURSE CALL
U25
LM317
P5
4447808
+15V
+5V
/BUFFERED_RST
GND
+15V_VBAT RETURN
BUFFERED IO(8)
BUFFERED IO(9)
BUFFERED IO(4)
P4
4447812
BUFFERED IO(2)
BUFFERED IO(10)
LIGHTING_COMMON
INDIRECT LIGHT, RIGHT
INDIRECT LIGHT, LEFT
DIRECT LIGHT, RIGHT
DIRECT LIGHT, LEFT
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
RADIO_CONTROL_LEFT
TV_CHANNEL_STEPPING (-)
TV_CHANNEL_STEPPING (+)
NURSE CALL
BED EXIT
BUNTING 1-2
JP1
JP2
3059003
STANDARD 2-3
K1
K2
4842601
NURSE_CALL(+)
NURSE_CALL(-)
PRIORITY_CALL(+)
PRIORITY_CALL(-)
J2
RING
TIP
TS
SLEEVE
46989
PHONE JACK
P2
4851201
1-747375-3
RED_NURSE_ANSWER_LT (+)
RED_NURSE_ANSWER_LT (-)
YELLOW_NURSE_CALL_LT (-)
YELLOW_NURSE_CALL_LT (+)
CIB_CLOCK
CIB_DATA_TRANSMIT
CIB_DATA_RECEIVE
AUDIO_TRANSFER (-)
AUDIO_TRANSFER(+)
INTERLOCK (+)
INTERLOCK (-)
LIGHTING_COMMON
INDIRECT LIGHT, RIGHT
INDIRECT_LIGHT_LEFT
DIRECT LIGHT, RIGHT
DIRECT_LIGHT_LEFT
AUX_POSITIVE_SUPPLY
DC + (YELLOW SUBDUED LT)
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
RADIO_CONTROL_LEFT
SPEAKER_HIGHT_LEFT
VOLUME_CONTROL_WIPER_LEFT
VOLUME_CONTROL_LOW_COMMON
NURSE_CALL(+)
NURSE_CALL(-)
NURSE_CALL_INTERLOCK
VOLUME_CONTROL_HI_COMMON
VOLUME_CONTROL_WIPER, RIGHT
PRIORITY CALL (+)
PRIORITY_CALL (-) /CIB COMM
OPTIONAL_SWITCH_1
TV_CHANNEL_STEPPING (-)
TV_CHANNEL_STEPPING (+)
SPEAKER_LOW_COMMON
DRAIN
SPEAKER HIGHT, RIGHT
SPHL
VCL
VCLC
VCHC
VCR
SPLC
SPOR
SPHR
m112c298

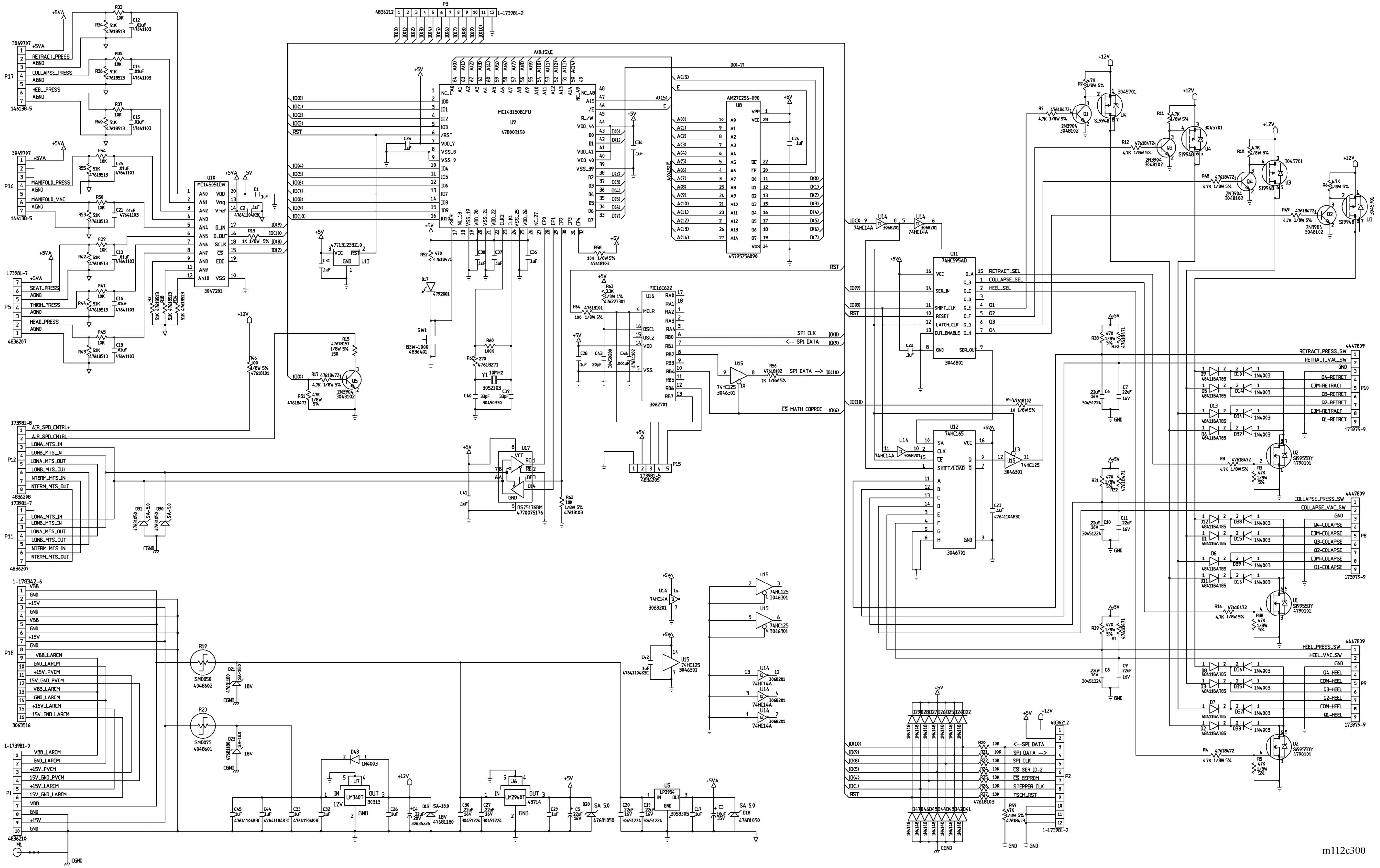
P.C. Board Wiring Schematic Diagram—SideCom® Communication System with COMposer® Communication System (P/N 64077)

ASSY DASH NO.	DESCRIPTION	NURSE CALL OPTION MATRIX		
		R46	R47	R48
-01	HILL-ROM STANDARD	NOT	INSTALL	INSTALL
-02	BUNTING	INSTALL	NOT	NOT


FROM JUNCTION BOX
NEURON I/O TEST PORT
AUXIL. NETWORK CONNECTOR
LON INTERCONNECTION
P7
VBAT
GND
VBB
LONA
LONB
+15VBAT
+15V
VOL_CNT_RIGHT
VOL_CNT_LOW
VOL_CNT_HI
SPKR_HI_RIGHT
SPKR_LOW
SPKR_DRAIN
P6
POWER SUPPLY MODULE
U31
LM2940
U20
U21
478003150
U4
U29
U24
U14
U15
U10
U11
U12
U30
LM317
P5
/BUFFERED_RST
+15V_VBAT RETURN
BUFFERED IO(8)
BUFFERED IO(9)
BUFFERED IO(4)
P4
BUFFERED IO(2)
BUFFERED IO(10)
LIGHTING_COMMON
INDIRECT LIGHT, RIGHT
INDIRECT_LIGHT_LEFT
DIRECT LIGHT, RIGHT
DIRECT_LIGHT_LEFT
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
RADIO_CONTROL_LEFT
TV_CHANNEL_STEPPING (-)
TV_CHANNEL_STEPPING (+)
SPI_CLOCK-->
SPI_DATA_OUT-->
<--SPI_DATA_IN
COMMON
/RST
RED NURSE ANSWER
YELLOW NURSE CALL
NURSE CALL
BED EXIT
NURSE_CALL(+)
NURSE_CALL(-)
PRIORITY_CALL(+)
STANDARD
BUNTING
K1
K2
J2
RING
TIP
TS
SLEEVE
46989 PHONE JACK
P2
4851201
1-747375-3
RED_NURSE_ANSWER_LT (+)
RED_NURSE_ANSWER_LT (-)
YELLOW_NURSE_CALL_LT (-)
YELLOW_NURSE_CALL_LT (+)
CIB_CLOCK
CIB_DATA_TRANSMIT
CIB_DATA_RECEIVE
AUDIO_TRANSFER (-)
AUDIO_TRANSFER(+)
INTERLOCK (+)
INTERLOCK (-)
LIGHTING_COMMON
INDIRECT LIGHT, RIGHT
INDIRECT_LIGHT_LEFT
DIRECT LIGHT, RIGHT
DIRECT_LIGHT_LEFT
AUX_POSITIVE_SUPPLY
DC + (YELLOW SUBDUED LT)
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
RADIO_CONTROL_LEFT
SPEAKER_HIGHT_LEFT
VOLUME_CONTROL_WIPER_LEFT
VOLUME_CONTROL_LOW_COMMON
NURSE_CALL(+)
NURSE_CALL(-)
NURSE_CALL_INTERLOCK
VOLUME_CONTROL_HI_COMMON
VOLUME_CONTROL_WIPER, RIGHT
PRIORITY CALL (+)
PRIORITY_CALL (-) /CIB COMM
OPTIONAL_SWITCH_1
TV_CHANNEL_STEPPING (-)
TV_CHANNEL_STEPPING (+)
SPEAKER_LOW_COMMON
DRAIN
SPEAKER HIGHT, RIGHT

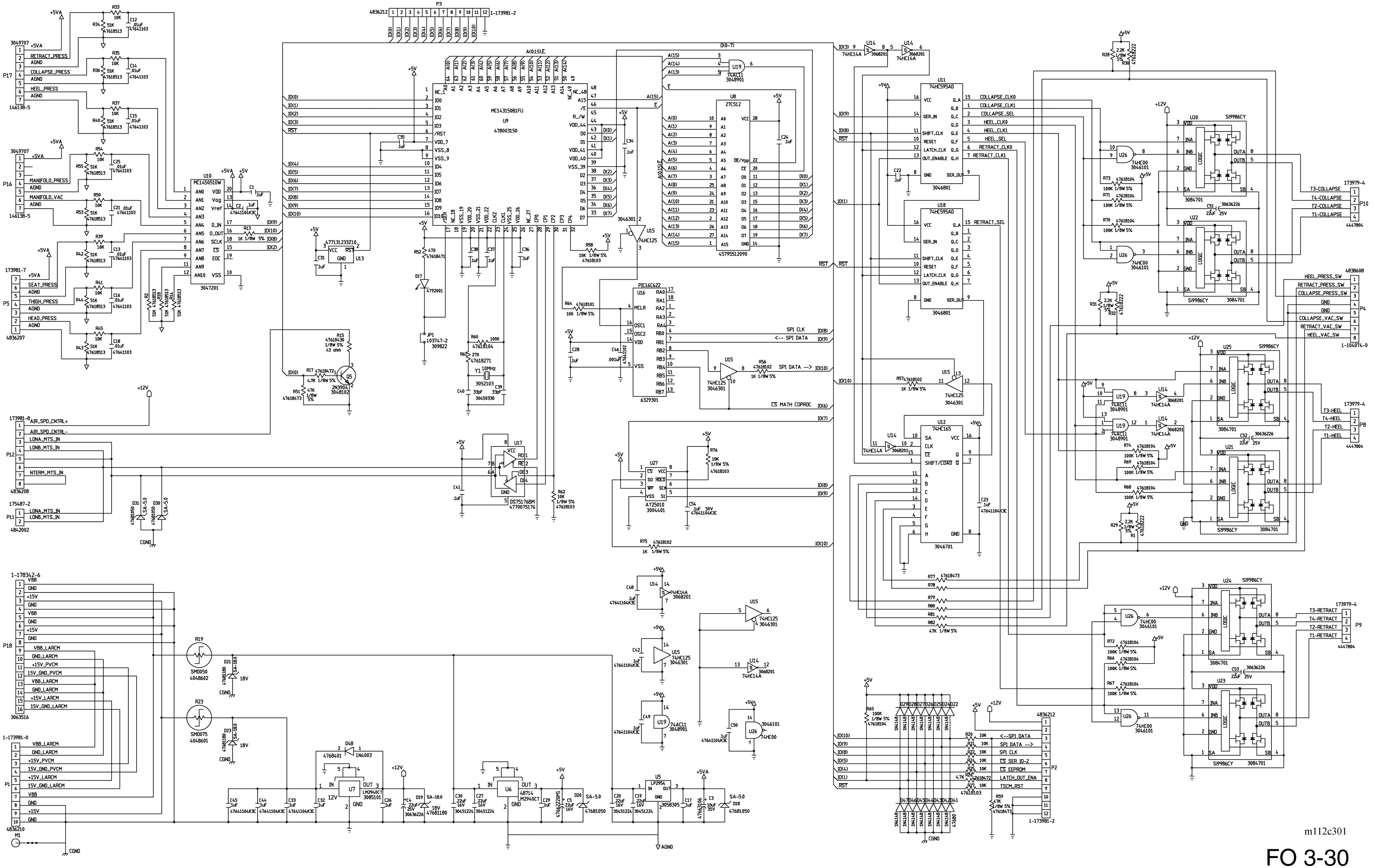
m112c299

P.C. Board Wiring Schematic Diagram—Treatment Foot Surface Control Module (P/N 47396)


P17
RETRACT_PRESS
COLLAPSE_PRESS
HEEL_PRESS
AGND
+5VA
P16
MANIFOLD_PRESS
MANIFOLD_VAC
P5
SEAT_PRESS
THIGH_PRESS
HEAD_PRESS
U10
MC14505 1DW
AN0
AN1
AN2
AN3
AN4
AN5
AN6
AN7
AN8
AN9
AN10
VDD
Vag
Vref
D_IN
D_OUT
SCLK
CS
EOC
VSS
3047201
P3
4836212
1-173981-2
U9
MC143150B1FU
478003150
A(0:15),E
D(0-7)
U8
AM27C256-090
45795256090
U13
477131233210
D17
4792001
SW1
B3W-1000
4836401
Y1
10MHz
3052103
U16
PIC16C622
3062701
MCLR
OSC1
OSC2
RA0
RA1
RA2
RA3
RA4
RB0
RB1
RB2
RB3
RB4
RB5
RB6
RB7
SPI CLK
<-- SPI DATA
SPI DATA -->
CS MATH COPROC
U15
74HC125
3046301
U14
74HC14A
3068201
U11
74HC595AD
3046801
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
SER_OUT
RETRACT_SEL
COLLAPSE_SEL
HEEL_SEL
Q1
Q2
Q3
Q4
U12
74HC165
3046701
SHIFT/LOAD
U17
DS75176BM
4770075176
P12
P11
AIR_SPD_CNTRL+
AIR_SPD_CNTRL-
LONA_MTS_IN
LONB_MTS_IN
LONA_MTS_OUT
LONB_MTS_OUT
NTERM_MTS_IN
NTERM_MTS_OUT
D31
D30
SA-5.0
CGND
P15
173981-5
4836205
Q5
2N3904
3048102
P18
1-178342-6
VBB
GND
+15V
VBB_LARCM
GND_LARCM
+15V_PVCM
15V_GND_PVCM
+15V_LARCM
15V_GND_LARCM
3063516
P1
1-173981-0
4836210
M1
R19
SMD050
4048602
R23
SMD075
4048601
D21
D23
SA-18.0
18V
U7
LM340T
30313
12V
D48
1N4003
U6
LM2940T
48714
U5
LP2954
3058305
D19
D20
D18
+12V
+5V
+5VA
Q1
Q2
Q3
Q4
SI9948
3045701
2N3904
3048102
U1
U2
U3
U4
SI9955DY
4790101
P10
RETRACT_PRESS_SW
RETRACT_VAC_SW
Q4-RETRACT
COM-RETRACT
Q3-RETRACT
Q2-RETRACT
Q1-RETRACT
173979-9
4447809
P8
COLLAPSE_PRESS_SW
COLLAPSE_VAC_SW
Q4-COLAPSE
COM-COLAPSE
Q3-COLAPSE
Q2-COLAPSE
Q1-COLAPSE
P9
HEEL_PRESS_SW
HEEL_VAC_SW
Q4-HEEL
COM-HEEL
Q3-HEEL
Q2-HEEL
Q1-HEEL
48411BAT85
1N4003
P2
4836212
<--SPI DATA
SPI DATA -->
SPI CLK
CS SER IO-Z
CS EEPROM
STEPPER CLK
TSCM_RST
1-173981-2
1N4148
R59
47618473
ID(0)
ID(1)
ID(2)
ID(3)
ID(4)
ID(5)
ID(6)
ID(7)
ID(8)
ID(9)
ID(10)
RST

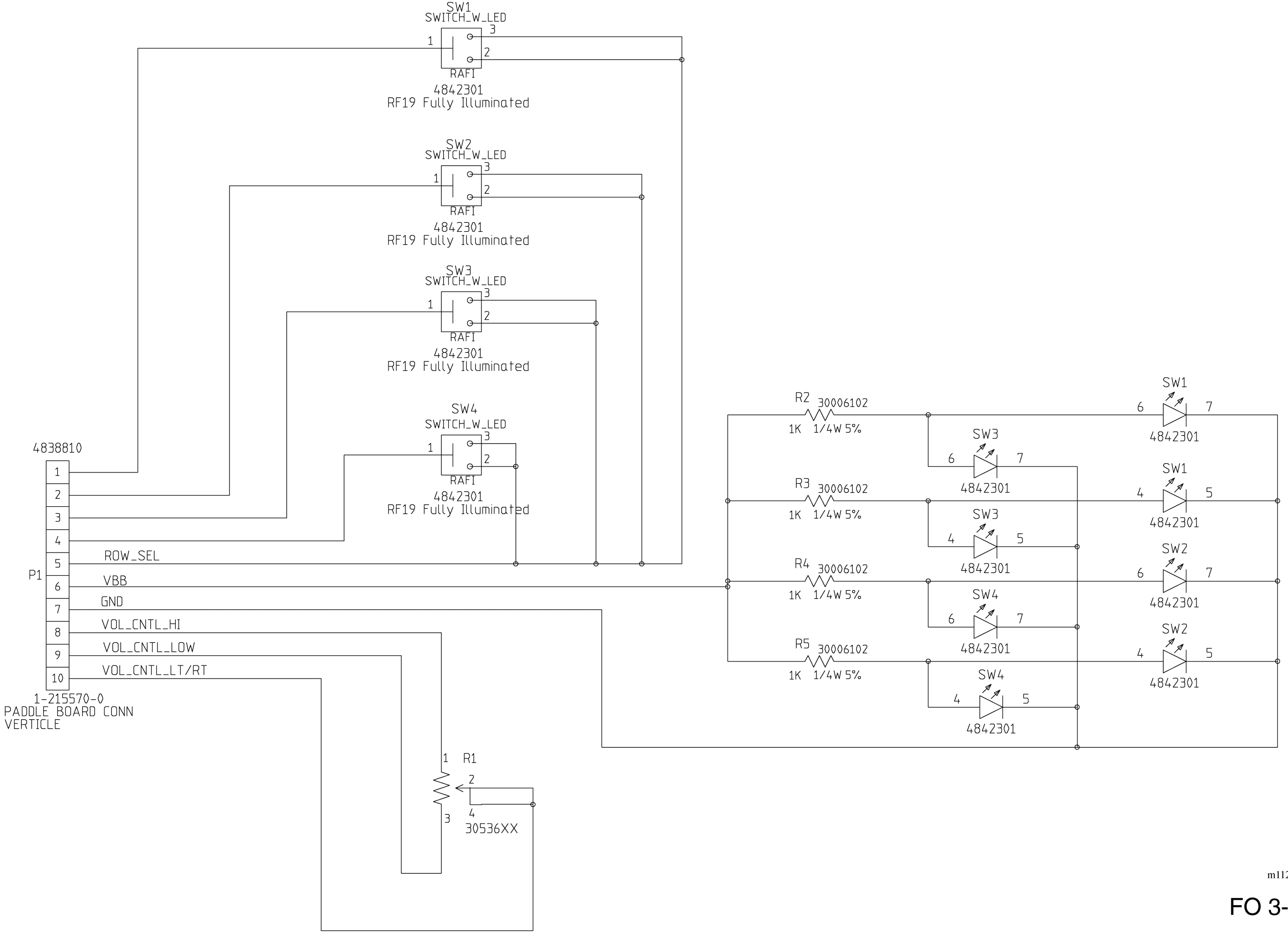
m112c300

P.C. Board Wiring Schematic Diagram—Treatment Foot Surface Control Module (P/N 48469)


P3
P17
P16
P5
P12
P11
P18
P1
M1
U10 MC14505IDW
U9 MC14315081FU
U8 27C512
U19 74AC11
U14 74HC14A
U15 74HC125
U16 PIC16C622
U27 AT25010
U17 DS75176BM
U11 74HC595AD
U18 74HC595AD
U12 74HC165
U20 SI9986CY
U22
U25 SI9986CY
U21
U24 SI9986CY
U23
U26 74HC00
U7 LM2940CT
U6 LM2940CT
U5 LP2954
P10
P4
P8
P9
P2
Q5 2N3904
Y1 10MHz
R19 SMD050
R23 SMD075
CGND
AGND
+5V
+5VA
+12V
COLLAPSE_CLK0
COLLAPSE_CLK1
COLLAPSE_SEL
HEEL_CLK0
HEEL_CLK1
HEEL_SEL
RETRACT_CLK0
RETRACT_CLK1
RETRACT_SEL
T3-COLLAPSE
T4-COLLAPSE
T2-COLLAPSE
T1-COLLAPSE
T3-HEEL
T4-HEEL
T2-HEEL
T1-HEEL
T3-RETRACT
T4-RETRACT
T2-RETRACT
T1-RETRACT
HEEL_PRESS_SW
RETRACT_PRESS_SW
COLLAPSE_PRESS_SW
COLLAPSE_VAC_SW
RETRACT_VAC_SW
HEEL_VAC_SW
RETRACT_PRESS
COLLAPSE_PRESS
HEEL_PRESS
MANIFOLD_PRESS
MANIFOLD_VAC
SEAT_PRESS
THIGH_PRESS
HEAD_PRESS
AIR_SPD_CNTRL+
AIR_SPD_CNTRL-
LONA_MTS_IN
LONB_MTS_IN
NTERM_MTS_IN
SPI CLK
SPI DATA
CS MATH COPROC
CS EEPROM
LATCH_OUT_ENA
TSCM_RST
CS SER ID-2

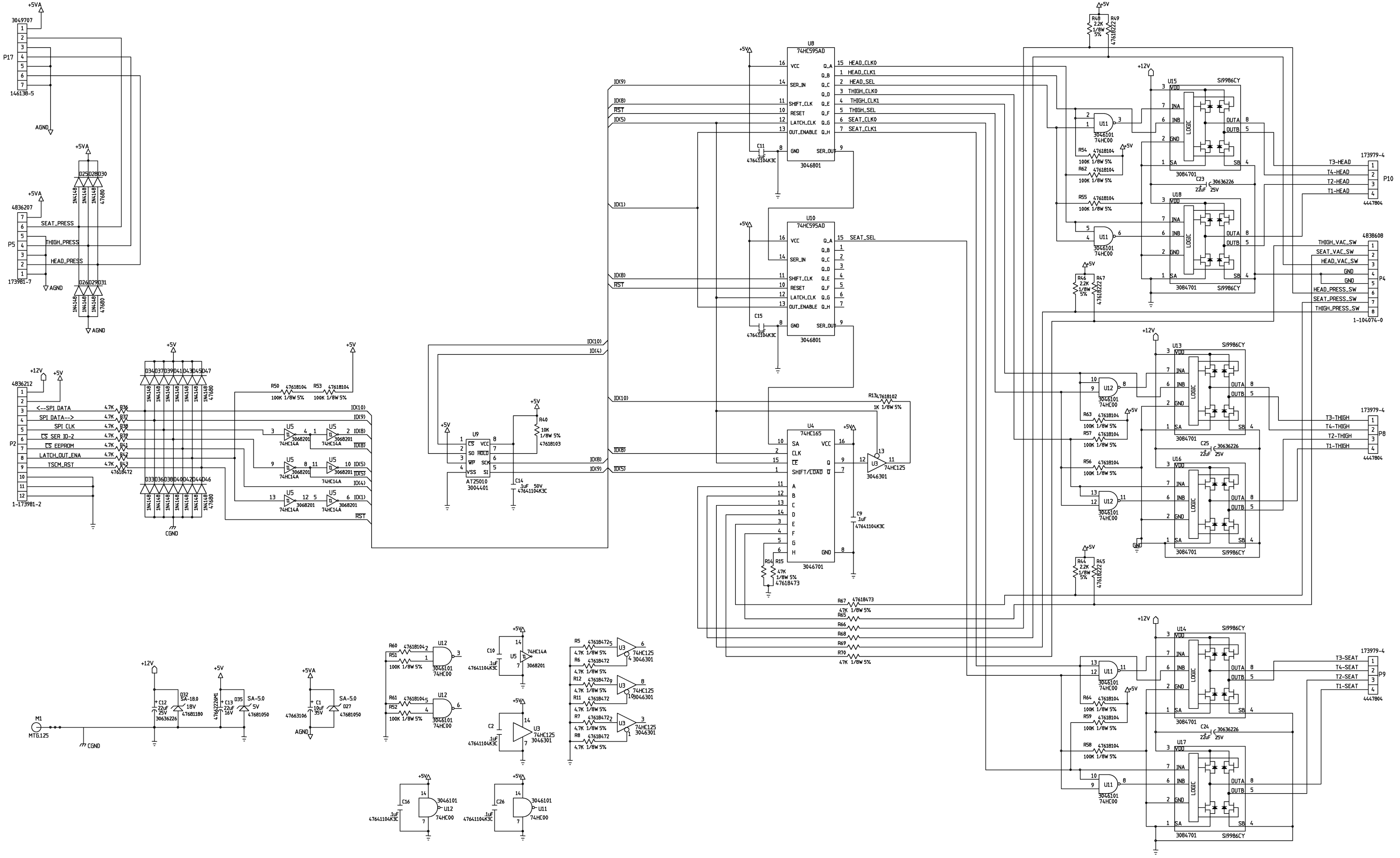
m112c301

P.C. Board Wiring Schematic Diagram—Patient Articulation/Entertainment (P/N 48390)


SW1
SWITCH_W_LED
RAFI
4842301
RF19 Fully Illuminated
SW2
SWITCH_W_LED
RAFI
4842301
RF19 Fully Illuminated
SW3
SWITCH_W_LED
RAFI
4842301
RF19 Fully Illuminated
SW4
SWITCH_W_LED
RAFI
4842301
RF19 Fully Illuminated
4838810
P1
ROW_SEL
VBB
GND
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LT/RT
1-215570-0
PADDLE BOARD CONN
VERTICLE
R1
30536XX
R2 30006102
1K 1/4W 5%
R3 30006102
1K 1/4W 5%
R4 30006102
1K 1/4W 5%
R5 30006102
1K 1/4W 5%
SW1 4842301
SW1 4842301
SW2 4842301
SW2 4842301
SW3 4842301
SW3 4842301
SW4 4842301
SW4 4842301

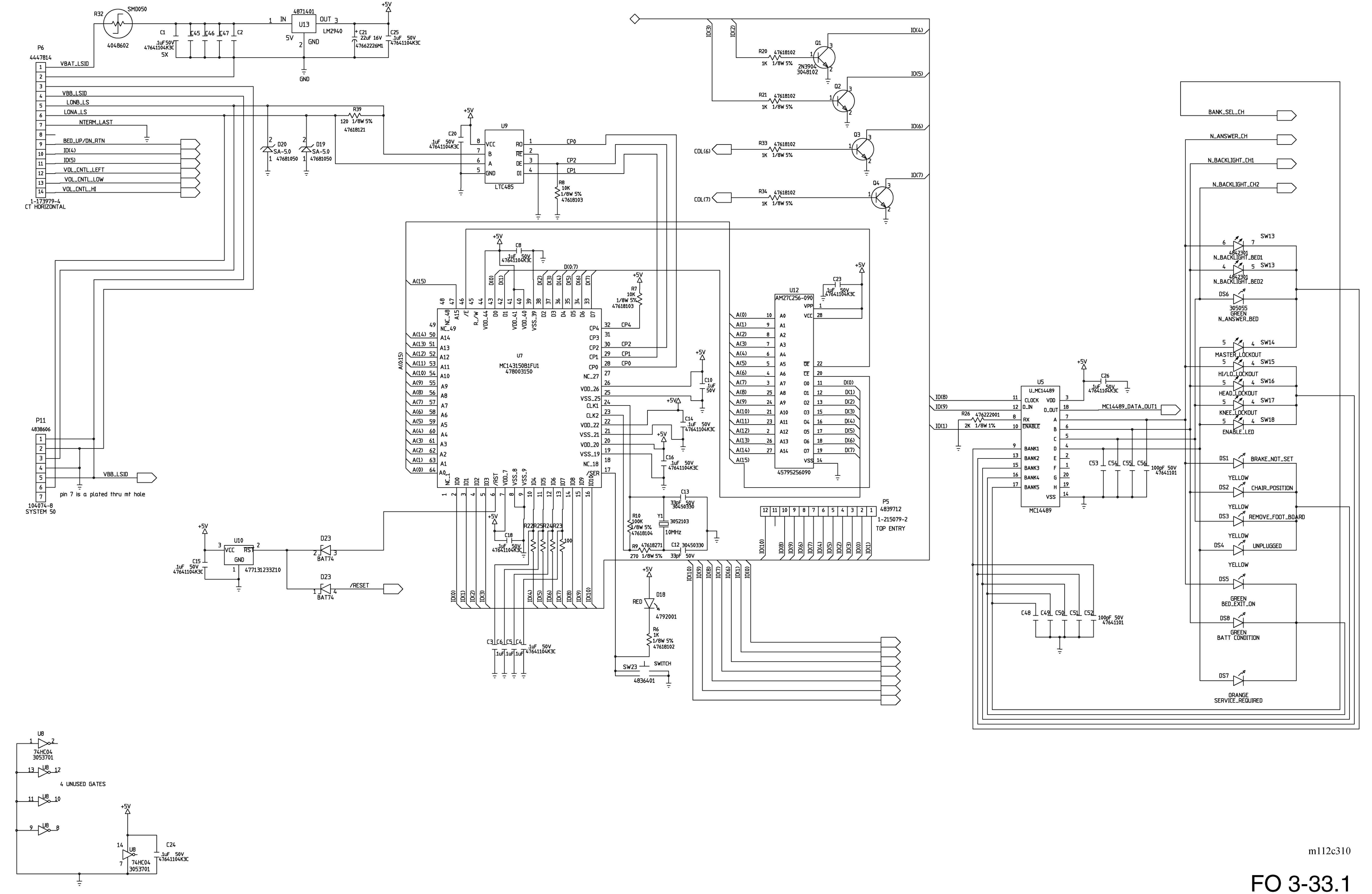
m112c302

P.C. Board Wiring Schematic Diagram—Torso Control Module (P/N 48472)

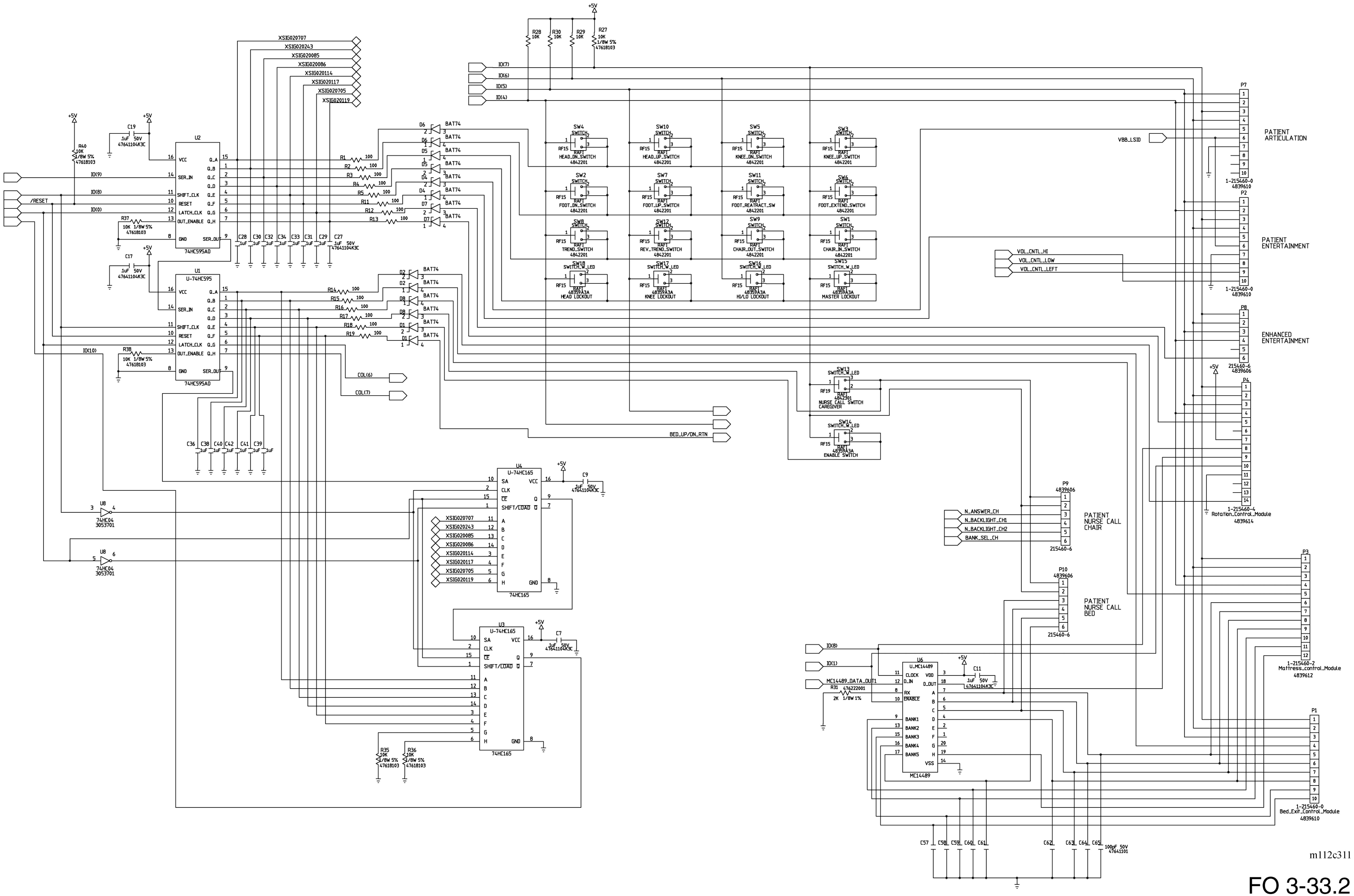

P17
3049707
146138-5
AGND
+5VA
P5
4836207
SEAT_PRESS
THIGH_PRESS
HEAD_PRESS
173981-7
1N4148
47680
P2
4836212
<--SPI DATA
SPI DATA-->
SPI CLK
CS SER IO-2
CS EEPROM
LATCH_OUT_ENA
TSCM_RST
1-173981-2
CGND
U5
74HC14A
3068201
U9
AT25010
3004401
U8
74HC595AD
3046801
HEAD_CLK0
HEAD_CLK1
HEAD_SEL
THIGH_CLK0
THIGH_CLK1
THIGH_SEL
SEAT_CLK0
SEAT_CLK1
U10
74HC595AD
SEAT_SEL
U4
74HC165
3046701
U3
74HC125
3046301
U11
U12
74HC00
3046101
U13
U14
U15
U16
U17
U18
SI9986CY
3084701
P10
173979-4
T3-HEAD
T4-HEAD
T2-HEAD
T1-HEAD
4447804
P4
4838608
THIGH_VAC_SW
SEAT_VAC_SW
HEAD_VAC_SW
GND
HEAD_PRESS_SW
SEAT_PRESS_SW
THIGH_PRESS_SW
1-104074-0
P8
T3-THIGH
T4-THIGH
T2-THIGH
T1-THIGH
P9
T3-SEAT
T4-SEAT
T2-SEAT
T1-SEAT
M1
MTG.125
+12V
+5V

m112c303

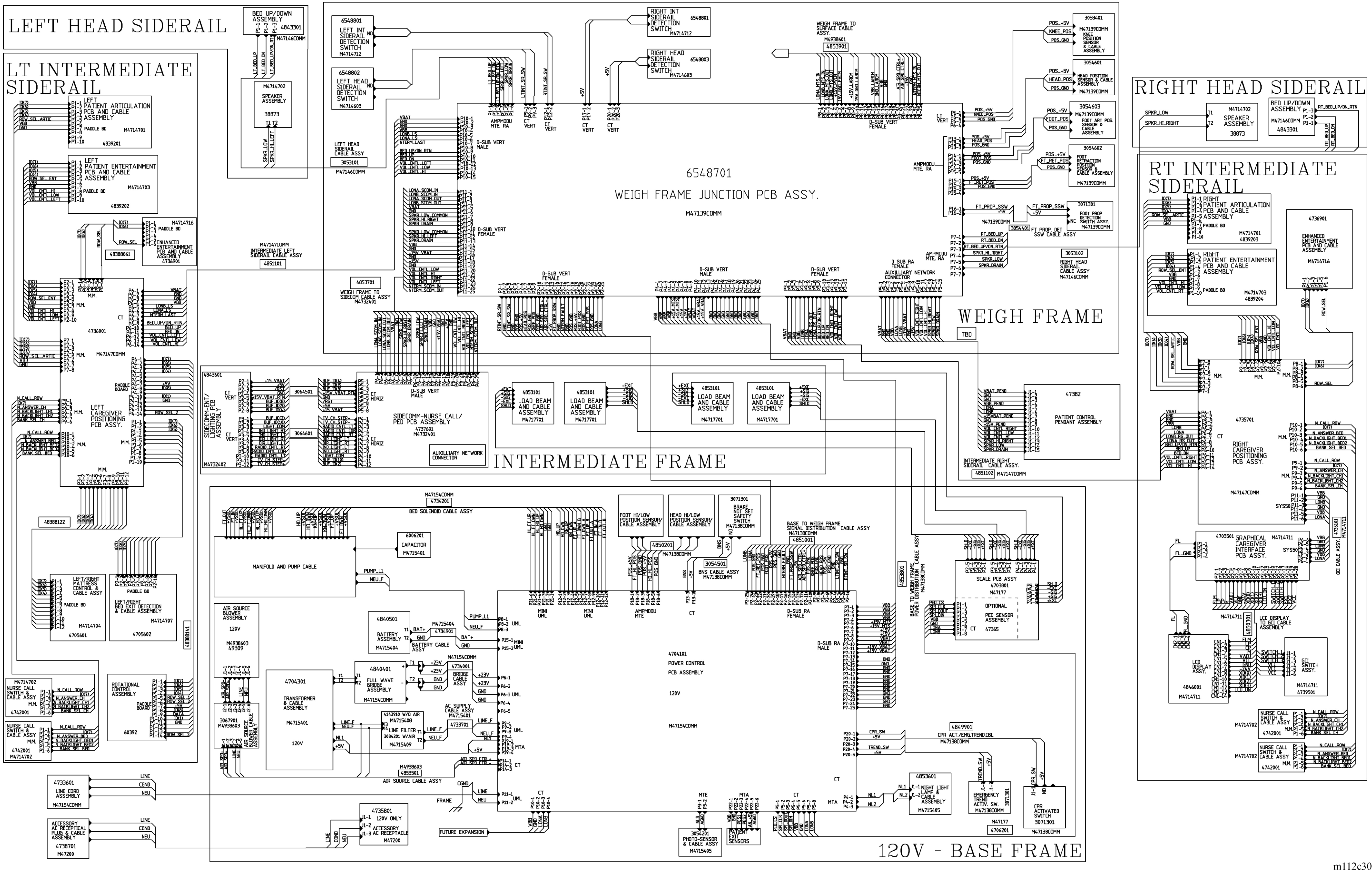
P.C. Board Wiring Schematic Diagram—Left Side User Control Module (P/N 47354) Sheet 1 of 2


R32
SMD050
4048602
C1
C45
C46
C47
C2
.1uF 50V
47641104K3C
5X
4871401
U13
IN
OUT
LM2940
5V
GND
C21
22uF 16V
47662226M1
C25
.1uF 50V
47641104K3C
+5V
P6
4447814
VBAT_LSID
VBB_LSID
LONB_LS
LONA_LS
NTERM_LAST
BED_UP/DN_RTN
ID(4)
ID(5)
VOL_CNTL_LEFT
VOL_CNTL_LOW
VOL_CNTL_HI
1-173979-4
CT HORIZONTAL
R39
120 1/8W 5%
47618121
D20
SA-5.0
47681050
D19
SA-5.0
47681050
C20
U9
LTC485
VCC
RO
RE
DE
DI
GND
CP0
CP1
CP2
CP4
R8
10K
1/8W 5%
47618103
U7
MC143150B1FU1
478003150
A(15)
A(0:15)
D(0:7)
R7
10K
1/8W 5%
47618103
C8
C10
C13
C14
C16
C18
Y1
3052103
10MHz
C12
30450330
R10
100K
1/8W 5%
47618104
R9
47618271
270 1/8W 5%
33pF 50V
R22 R25 R24 R23
100
U12
AM27C256-090
45795256090
C23
P5
4839712
1-215079-2
TOP ENTRY
U5
U_MC14489
MC14489
CLOCK
D_IN
RX ENABLE
BANK1
BANK2
BANK3
BANK4
BANK5
VDD
D_OUT
VSS
MC14489_DATA_OUT1
R26
47622001
2K 1/8W 1%
C26
C53 C54 C55 C56
100pF 50V
47641101
C48 C49 C50 C51 C52
Q1
Q2
Q3
Q4
2N3904
3048102
R20
R21
R33
R34
47618102
1K 1/8W 5%
COL(6)
COL(7)
BANK_SEL_CH
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
SW13
N_BACKLIGHT_BED1
N_BACKLIGHT_BED2
4842301
DS6
305055
GREEN
N_ANSWER_BED
SW14
MASTER_LOCKOUT
SW15
HI/LO_LOCKOUT
SW16
HEAD_LOCKOUT
SW17
KNEE_LOCKOUT
SW18
ENABLE_LED
DS1
BRAKE_NOT_SET
YELLOW
DS2
CHAIR_POSITION
DS3
REMOVE_FOOT_BOARD
DS4
UNPLUGGED
DS5
BED_EXIT_ON
DS8
BATT CONDITION
DS7
ORANGE
SERVICE_REQUIRED
P11
4838606
VBB_LSID
pin 7 is a plated thru mt hole
104074-8
SYSTEM 50
U10
477131233Z10
VCC
RST
C15
D23
BAT74
/RESET
C3 C6 C5 C4
.1uF 50V
47641104K3C
D18
RED
4792001
R6
1K
1/8W 5%
47618102
SW23
SWITCH
4836401
U8
74HC04
3053701
4 UNUSED GATES
C24
m112c310

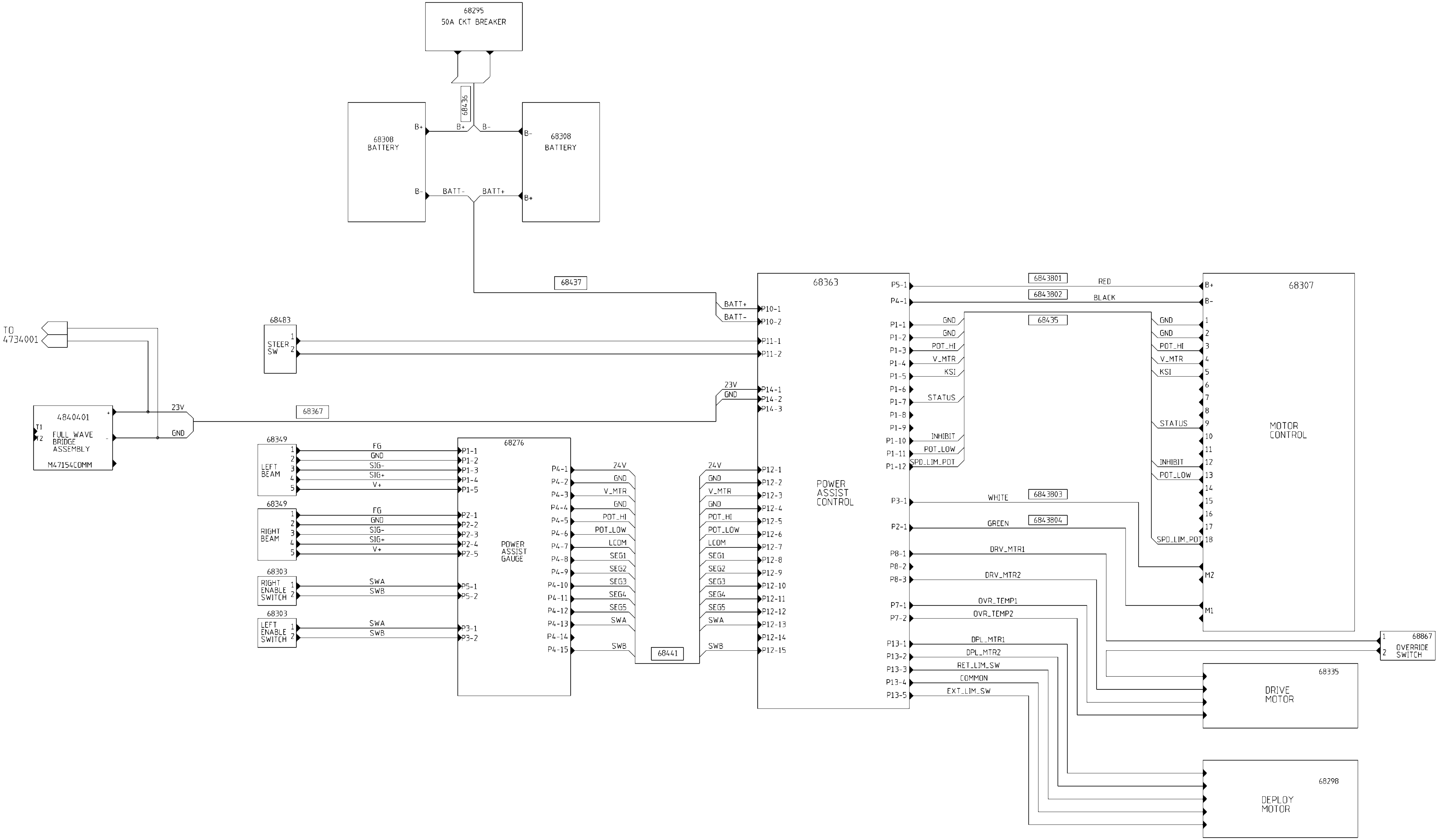
P.C. Board Wiring Schematic Diagram—Left Side User Control Module (P/N 47354) Sheet 2 of 2


+5V
R28 10K
R30 10K
R29 10K
R27 10K 1/8W 5% 47618103
IO(7)
IO(6)
IO(5)
IO(4)
XSIG020707
XSIG020243
XSIG020085
XSIG020086
XSIG020114
XSIG020117
XSIG020705
XSIG020119
U2
74HC595AD
U1
U-74HC595
74HC595AD
VCC
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
GND
SER_OUT
Q_A
Q_B
Q_C
Q_D
Q_E
Q_F
Q_G
Q_H
R40 10K 1/8W 5% 47618103
C19 .1uF 50V 47641104K3C
C17 .1uF 50V 47641104K3C
IO(9)
IO(8)
IO(0)
IO(10)
/RESET
R37 10K 1/8W 5% 47618103
R38 10K 1/8W 5% 47618103
C28 C30 C32 C34 C33 C31 C29
C27 .1uF 50V 47641104K3C
R1 R2 R3 R4 R5 R11 R12 R13 100
R14 R15 R16 R17 R18 R19 100
D6 D5 D4 D7 D2 D8 D1
BAT74
COL(6)
COL(7)
C36 C38 C40 C42 C41 C39 .1uF
SW4 SWITCH RF15 RAFI HEAD_DN_SWITCH 4842201
SW10 SWITCH RF15 RAFI HEAD_UP_SWITCH 4842201
SW5 SWITCH RF15 RAFI KNEE_DN_SWITCH 4842201
SW3 SWITCH RF15 RAFI KNEE_UP_SWITCH 4842201
SW2 SWITCH RF15 RAFI FOOT_DN_SWITCH 4842201
SW7 SWITCH RF15 RAFI FOOT_UP_SWITCH 4842201
SW11 SWITCH RF15 RAFI FOOT_REATRACT_SW 4842201
SW6 SWITCH RF15 RAFI FOOT_EXTEND_SWITCH 4842201
SW8 SWITCH RF15 RAFI TREND_SWITCH 4842201
SW12 SWITCH RF15 RAFI REV_TREND_SWITCH 4842201
SW9 SWITCH RF15 RAFI CHAIR_OUT_SWITCH 4842201
SW1 SWITCH RF15 RAFI CHAIR_IN_SWITCH 4842201
SW18 SWITCH_W_LED RF15 RAFI 48359A3A HEAD LOCKOUT
SW17 SWITCH_W_LED RF15 RAFI 48359A3A KNEE LOCKOUT
SW16 SWITCH_W_LED RF15 RAFI 48359A3A HI/LO LOCKOUT
SW15 SWITCH_W_LED RF15 RAFI 48359A3A MASTER LOCKOUT
SW13 SWITCH_W_LED RF19 RAFI 4842301 NURSE CALL SWITCH CAREGIVER
SW14 SWITCH_W_LED RF15 RAFI 48359A3A ENABLE SWITCH
BED_UP/DN_RTN
VBB_LSID
VOL_CNTL_HI
VOL_CNTL_LOW
VOL_CNTL_LEFT
P7 1-215460-0 4839610 PATIENT ARTICULATION
P2 1-215460-0 4839610 PATIENT ENTERTAINMENT
P8 215460-6 4839606 ENHANCED ENTERTAINMENT
P4 1-215460-4 Rotation_Control_Module 4839614
P9 4839606 215460-6 PATIENT NURSE CALL CHAIR
P10 4839606 215460-6 PATIENT NURSE CALL BED
N_ANSWER_CH
N_BACKLIGHT_CH1
N_BACKLIGHT_CH2
BANK_SEL_CH
P3 1-215460-2 Mattress_control_Module 4839612
P1 1-215460-0 Bed_Exit_Control_Module 4839610
U8 74HC04 3053701
U4 U-74HC165 74HC165
U3 U-74HC165 74HC165
SA CLK CE SHIFT/LOAD Q A B C D E F G H GND VCC
C9 .1uF 50V 47641104K3C
C7 .1uF 50V 47641104K3C
R35 10K 1/8W 5% 47618103
R36 10K 1/8W 5% 47618103
IO(8)
IO(1)
MC14489_DATA_OUT1
R31 476222001 2K 1/8W 1%
U6 U_MC14489 MC14489
CLOCK D_IN RX ENABLE BANK1 BANK2 BANK3 BANK4 BANK5 VDD D_OUT VSS
C11 .1uF 50V 47641104K3C
C57 C58 C59 C60 C61 C62 C63 C64 C65 100pF 50V 47641101
m112c311

P.C. Board Wiring Schematic Diagram—TotalCare® Bed System—120V (P/N 47030) (P1900D)

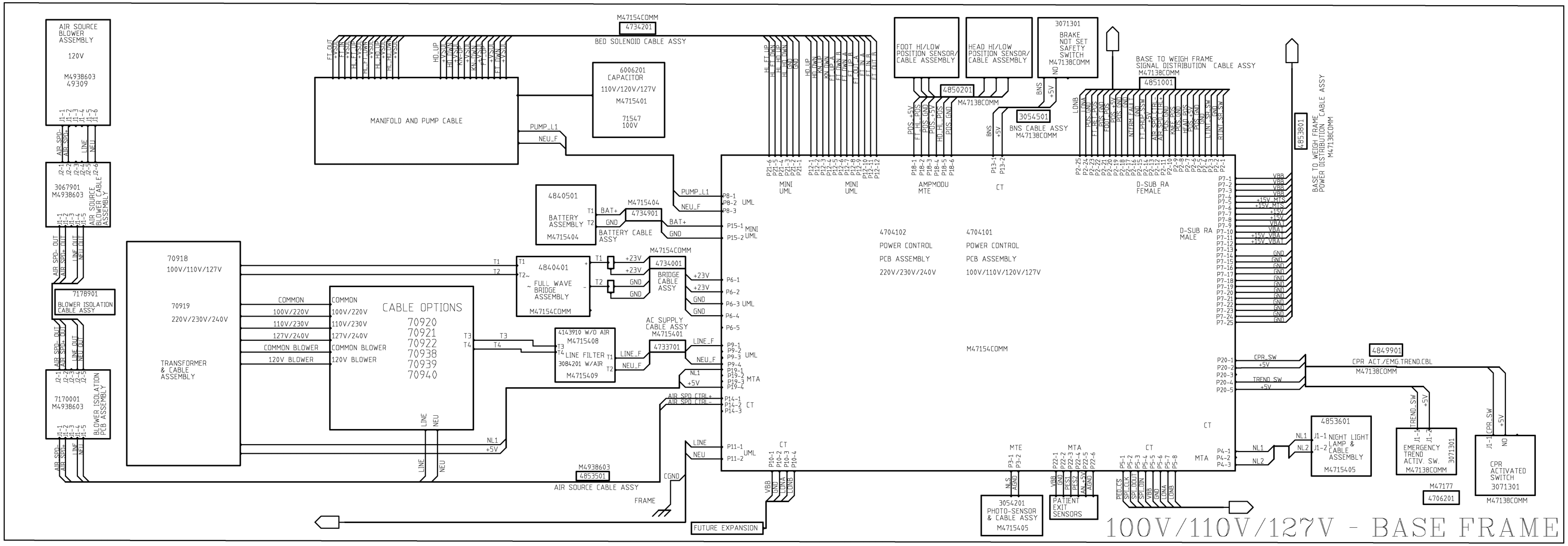

LEFT HEAD SIDERAIL
BED UP/DOWN ASSEMBLY 4843301
LT INTERMEDIATE SIDERAIL
LEFT PATIENT ARTICULATION PCB AND CABLE ASSEMBLY M4714701 4839201
LEFT PATIENT ENTERTAINMENT PCB AND CABLE ASSEMBLY M4714703 4839202
ENHANCED ENTERTAINMENT PCB AND CABLE ASSEMBLY 4736901 M4714716
4736001 M47147COMM
LEFT CAREGIVER POSITIONING PCB ASSY.
SPEAKER ASSEMBLY 38873 M4714702
6548801 LEFT INT SIDERAIL DETECTION SWITCH M4714712
6548802 LEFT HEAD SIDERAIL DETECTION SWITCH M4714603
LEFT HEAD SIDERAIL CABLE ASSY 3053101 M47146COMM
M47147COMM INTERMEDIATE LEFT SIDERAIL CABLE ASSY 4851101
4853701 WEIGH FRAME TO SIDECOM CABLE ASSY M4732401
RIGHT INT SIDERAIL DETECTION SWITCH 6548801 M4714712
RIGHT HEAD SIDERAIL DETECTION SWITCH 6548803 M4714603
6548701
WEIGH FRAME JUNCTION PCB ASSY.
M47139COMM
WEIGH FRAME TO SURFACE CABLE ASSY. M4938601 4853901
3058401 KNEE POSITION SENSOR & CABLE ASSEMBLY M47139COMM
3054601 HEAD POSITION SENSOR & CABLE ASSEMBLY M47139COMM
3054603 FOOT ART POS. SENSOR & CABLE ASSEMBLY M47139COMM
3054602 FOOT RETRACTION POSITION SENSOR & CABLE ASSEMBLY M47139COMM
3071301 FOOT PROP DETECTION SWITCH ASSY. M47139COMM
3054401 FT PROP. DET SSW CABLE ASSY
3053102 RIGHT HEAD SIDERAIL CABLE ASSY M47146COMM
WEIGH FRAME
TBD
RIGHT HEAD SIDERAIL
SPEAKER ASSEMBLY 38873 M4714702
BED UP/DOWN ASSEMBLY M47146COMM 4843301
RT INTERMEDIATE SIDERAIL
RIGHT PATIENT ARTICULATION PCB AND CABLE ASSEMBLY M4714701 4839203
RIGHT PATIENT ENTERTAINMENT PCB AND CABLE ASSEMBLY M4714703 4839204
4736901 ENHANCED ENTERTAINMENT PCB AND CABLE ASSEMBLY. M4714716
4735701 RIGHT CAREGIVER POSITIONING PCB ASSY. M47147COMM
4703501 GRAPHICAL CAREGIVER INTERFACE PCB ASSY. M4714711
LCD DISPLAY TO GCI CABLE ASSEMBLY 4850301 M4714711
LCD DISPLAY ASSY. 4846001 M4714711
GCI SWITCH ASSY. M4714711 4739501
NURSE CALL SWITCH & CABLE ASSY 4742001 M4714702
4843601 SIDECOMM-ENT/LIGHTING PCB ASSEMBLY M4732402
3064501
3064601
SIDECOMM-NURSE CALL/PED PCB ASSEMBLY 4737601 M4732401
AUXILLIARY NETWORK CONNECTOR
4853101 LOAD BEAM AND CABLE ASSEMBLY M4717701
INTERMEDIATE FRAME
47382 PATIENT CONTROL PENDANT ASSEMBLY
INTERMEDIATE RIGHT SIDERAIL CABLE ASSY. 4851102 M47147COMM
LEFT/RIGHT MATTRESS CONTROL & CABLE ASSY M4714704 4705601
LEFT/RIGHT BED EXIT DETECTION & CABLE ASSEMBLY M4714707 4705602
48388061
48388122
48388141
ROTATIONAL CONTROL ASSEMBLY 60392
M47154COMM 4734201 BED SOLENOID CABLE ASSY
MANIFOLD AND PUMP CABLE
6006201 CAPACITOR M4715401
AIR SOURCE BLOWER ASSEMBLY 120V M4938603 49309
3067901 M4938603
4704301 TRANSFORMER & CABLE ASSEMBLY M4715401 120V
4840501 BATTERY ASSEMBLY M4715404
M4715404 4734901 BATTERY CABLE ASSY
4840401 FULL WAVE BRIDGE ASSEMBLY M47154COMM
M47154COMM 4734001 BRIDGE CABLE ASSY
4143910 W/O AIR M4715408 LINE FILTER 3084201 W/AIR M4715409
AC SUPPLY CABLE ASSY M4715401 4733701
M4938603 4853501 AIR SOURCE CABLE ASSY
FOOT HI/LOW POSITION SENSOR/CABLE ASSEMBLY
HEAD HI/LOW POSITION SENSOR/CABLE ASSEMBLY
4850201 M47138COMM
3071301 BRAKE NOT SET SAFETY SWITCH M47138COMM
3054501 BNS CABLE ASSY M47138COMM
BASE TO WEIGH FRAME SIGNAL DISTRIBUTION CABLE ASSY M47138COMM 4851001
4853801 BASE TO WEIGH FRAME POWER DISTRIBUTION CABLE ASSY M47138COMM
SCALE PCB ASSY 4703801 M47177
OPTIONAL PED SENSOR ASSEMBLY 47365
4704101 POWER CONTROL PCB ASSEMBLY 120V M47154COMM
4849901 CPR ACT./EMG.TREND.CBL M47138COMM
4853601 NIGHT LIGHT LAMP & CABLE ASSEMBLY M4715405
EMERGENCY TREND ACTIV. SW. 3071301 M47138COMM
M47177 4706201
CPR ACTIVATED SWITCH 3071301 M47138COMM
3054201 PHOTO-SENSOR & CABLE ASSY M4715405
PATIENT EXIT SENSORS
4733601 LINE CORD ASSEMBLY M47154COMM
ACCESSORY AC RECEPTICAL PLUG & CABLE ASSEMBLY 4738701 M47200
4735801 120V ONLY ACCESSORY AC RECEPTACLE M47200
FUTURE EXPANSION
FRAME
120V - BASE FRAME

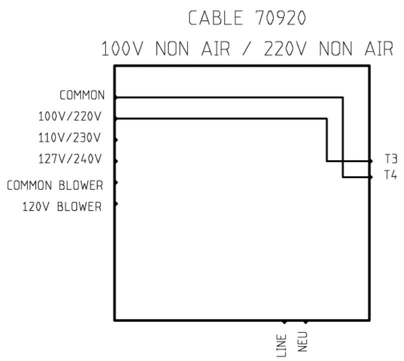
Wiring Diagram—IntelliDrive® Transport System

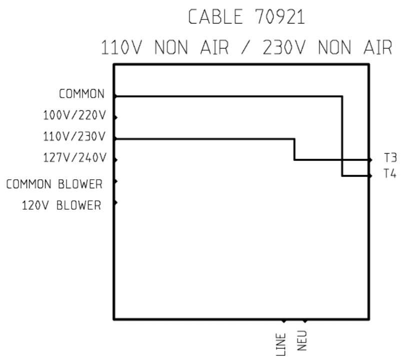

68295
50A CKT BREAKER
68436
68308
BATTERY
B+
B-
BATT-
BATT+
68437
TO
4734001
4840401
FULL WAVE
BRIDGE
ASSEMBLY
M47154COMM
T1
T2
23V
GND
68367
68483
STEER
SW
68349
LEFT
BEAM
RIGHT
BEAM
FG
GND
SIG-
SIG+
V+
68303
RIGHT
ENABLE
SWITCH
LEFT
ENABLE
SWITCH
SWA
SWB
68276
POWER
ASSIST
GAUGE
P1-1
P1-2
P1-3
P1-4
P1-5
P2-1
P2-2
P2-3
P2-4
P2-5
P5-1
P5-2
P3-1
P3-2
P4-1
P4-2
P4-3
P4-4
P4-5
P4-6
P4-7
P4-8
P4-9
P4-10
P4-11
P4-12
P4-13
P4-14
P4-15
24V
V_MTR
POT_HI
POT_LOW
LCOM
SEG1
SEG2
SEG3
SEG4
SEG5
68441
68363
POWER
ASSIST
CONTROL
P10-1
P10-2
P11-1
P11-2
P14-1
P14-2
P14-3
P12-1
P12-2
P12-3
P12-4
P12-5
P12-6
P12-7
P12-8
P12-9
P12-10
P12-11
P12-12
P12-13
P12-14
P12-15
P5-1
P4-1
P1-1
P1-2
P1-3
P1-4
P1-5
P1-6
P1-7
P1-8
P1-9
P1-10
P1-11
P1-12
KSI
STATUS
INHIBIT
SPD_LIM_POT
P3-1
P2-1
P8-1
P8-2
P8-3
P7-1
P7-2
P13-1
P13-2
P13-3
P13-4
P13-5
6843801
RED
6843802
BLACK
68435
6843803
WHITE
6843804
GREEN
DRV_MTR1
DRV_MTR2
OVR_TEMP1
OVR_TEMP2
DPL_MTR1
DPL_MTR2
RET_LIM_SW
COMMON
EXT_LIM_SW
68307
MOTOR
CONTROL
B+
B-
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
M2
M1
68867
OVERRIDE
SWITCH
68335
DRIVE
MOTOR
68298
DEPLOY
MOTOR

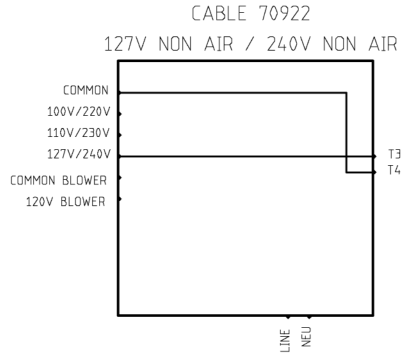
m112d337

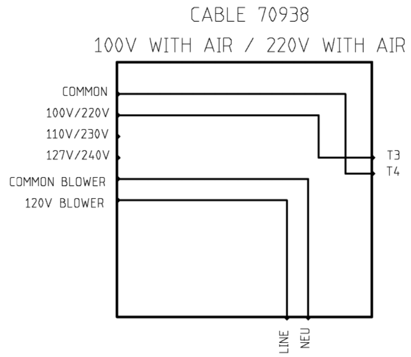
System Wiring Diagram—TotalCare® Bed System—100V/110V/127V (P/N 47030)

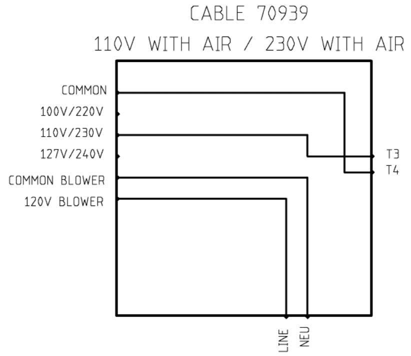

AIR SOURCE BLOWER ASSEMBLY
120V
M4938603
49309
3067901
M4938603
AIR SOURCE BLOWER CABLE ASSEMBLY
7178901
BLOWER ISOLATION CABLE ASSY
7170001
M4938603
BLOWER ISOLATION PCB ASSEMBLY
70918
100V/110V/127V
70919
220V/230V/240V
TRANSFORMER & CABLE ASSEMBLY
MANIFOLD AND PUMP CABLE
PUMP_L1
NEU_F
M47154COMM
4734201
BED SOLENOID CABLE ASSY
6006201
CAPACITOR
110V/120V/127V
M4715401
71547
100V
4840501
BATTERY ASSEMBLY
M4715404
M4715404
4734901
BATTERY CABLE ASSY
BAT+
GND
4840401
FULL WAVE BRIDGE ASSEMBLY
M47154COMM
M47154COMM
4734001
BRIDGE CABLE ASSY
+23V
GND
CABLE OPTIONS
70920
70921
70922
70938
70939
70940
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T1
T2
T3
T4
4143910 W/O AIR
M4715408
LINE FILTER
3084201 W/AIR
M4715409
AC SUPPLY CABLE ASSY
M4715401
4733701
LINE_F
NEU_F
NL1
+5V
AIR SPD CTRL+
AIR SPD CTRL-
LINE
NEU
M4938603
4853501
AIR SOURCE CABLE ASSY
CGND
FRAME
FUTURE EXPANSION
FOOT HI/LOW POSITION SENSOR/ CABLE ASSEMBLY
HEAD HI/LOW POSITION SENSOR/ CABLE ASSEMBLY
4850201
M47138COMM
3071301
BRAKE NOT SET SAFETY SWITCH
M47138COMM
BNS
3054501
BNS CABLE ASSY
M47138COMM
BASE TO WEIGH FRAME SIGNAL DISTRIBUTION CABLE ASSY
M47138COMM
4851001
4853801
BASE TO WEIGH FRAME POWER DISTRIBUTION CABLE ASSY
M47138COMM
MINI UML
MINI UML
AMPMODU MTE
CT
D-SUB RA FEMALE
D-SUB RA MALE
4704102
POWER CONTROL PCB ASSEMBLY
220V/230V/240V
4704101
POWER CONTROL PCB ASSEMBLY
100V/110V/120V/127V
M47154COMM
UML
MTA
CT
4849901
CPR ACT./EMG.TREND.CBL
M47138COMM
CPR_SW
TREND_SW
+5V
4853601
NIGHT LIGHT LAMP & CABLE ASSEMBLY
M4715405
NL1
NL2
EMERGENCY TREND ACTIV. SW.
M47138COMM
3071301
M47177
4706201
CPR ACTIVATED SWITCH
3071301
M47138COMM
3054201
PHOTO-SENSOR & CABLE ASSY
M4715405
PATIENT EXIT SENSORS
MTE
MTA
CT
100V/110V/127V - BASE FRAME

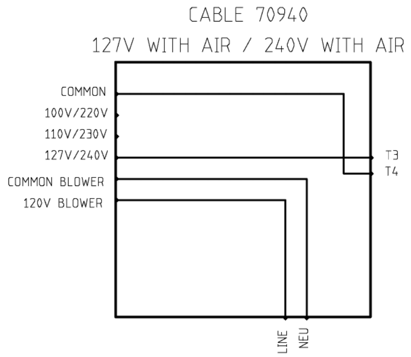

CABLE 70920
100V NON AIR / 220V NON AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU


CABLE 70921
110V NON AIR / 230V NON AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU


CABLE 70922
127V NON AIR / 240V NON AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU


CABLE 70938
100V WITH AIR / 220V WITH AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU


CABLE 70939
110V WITH AIR / 230V WITH AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU


CABLE 70940
127V WITH AIR / 240V WITH AIR
COMMON
100V/220V
110V/230V
127V/240V
COMMON BLOWER
120V BLOWER
T3
T4
LINE
NEU